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AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XV DECEMBER 13, 1926 NUMBER 21

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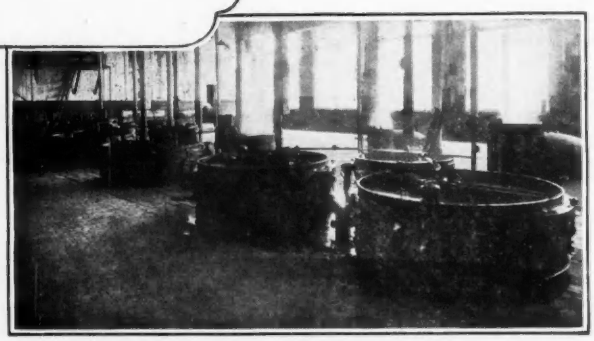

The illustration on the left shows a battery of Franklin Process Raw Stock Dyeing Machines in operation in a well known New England mill. Note the absence of dyehouse fog.

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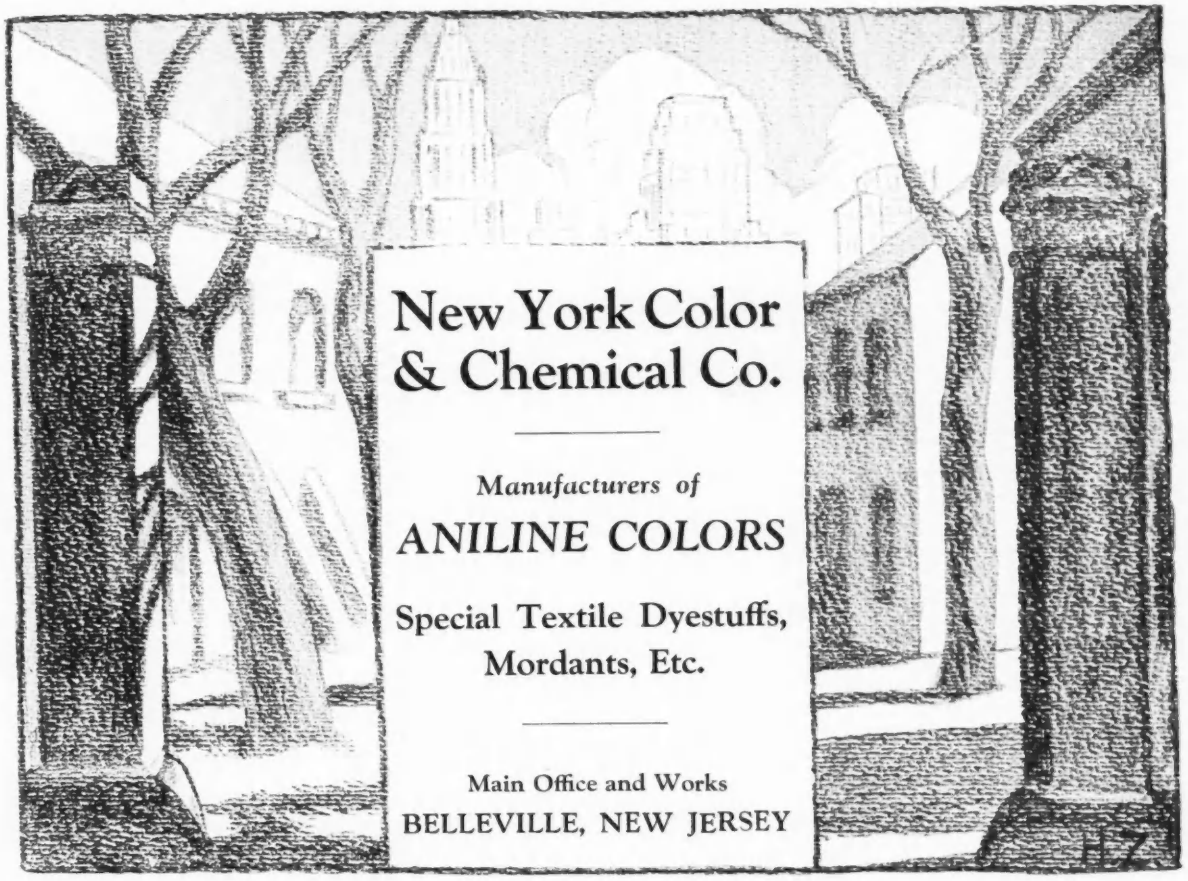

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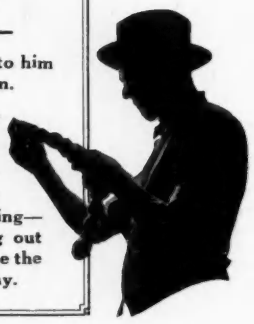

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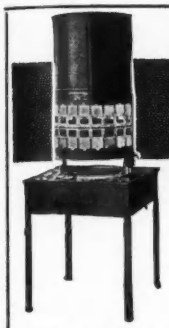

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VOLUME XV NEW YORK, DECEMBER 13, 1926 No. 21

Garment Dyeing

Difficulties Due to Various Fibers in Garments—Effect of Light Exposure—Stripping—Dyes Employed—Preliminary Treatment—The Dyeing Process—Removing Stains

By B. L. HATHORNE, B. T. C.

Pitman Manufacturing Company, Laconia, N. H.

EVERY textile colorist is occasionally requested to dye a garment for a friend, employer or employee. This frequently is somewhat of a problem, as the colorist may not have suitable facilities at hand and may not be acquainted with the particular problems that beset the garment dyer.

Coats, suits, skirts, etc., are the garments most frequently brought to the colorist for dyeing. These garments always contain cotton and wool, and often rayon besides. A garment made from all wool goods is usually sewed with cotton, so the cotton present must be matched to the wool.

It should be borne in mind that the garment is usually at least partly worn out so that sun fastness becomes of secondary importance. Most garments have a number of tightly stitched seams which means extreme difficulty of penetration.

The most important factor to be considered is the effect of exposure to sunlight on the wool in the garment. Coats and sweaters have usually received a great deal of direct sunlight on the shoulders and upper part of the back. Indeed, fading and change of color on the shoulders and back is the most frequent cause of redyeing.

The need for thorough scouring and wetting out is so obvious it is not deserving of mention.

Stripping

If it is necessary because of uneven fading to strip the garment before dyeing, this should be done as slowly as is practical. A very satisfactory method is to bring the goods to a boil in an excessively long bath to which a half to one per cent (on weight of goods) of laundry soda has been added; and to this bath add in small quantities ordinary sodium hydrosulphite such as is used for reducing vat colors, till about 5 per cent (on weight of goods) has been added, or the desired degree of stripping attained. This method of stripping seems to give more level results than an acid strip with any of the more complex "stripping" hydrosulphites or sulphoxalates. Of course, in some instances, a Glauber salt bath will suffice.

Many dyestuffs which might seem desirable on account of the shade required do not prove satisfactory for garments. It is wise to use dyestuffs which go on the goods very slowly. Direct cotton colors which boil slowly onto the wool, colors which dye only the cotton, and *slow dyeing* neutral dyeing wool colors, are the ones from which one must choose.

As it usually happens that the colorist must use for his garment a kettle or vat much too large, he should not worry about percentage of dyestuff used, but should use a large excess of color and should watch the garment closely so as to remove it when the proper depth has been attained.

Preliminary Treatment

Cotton draperies, portiers, couch covers, etc., are often brought in to be colored. The best preliminary treatment for this class of goods is a 30 to 45-minute boil in a 3 to 5 per cent solution of soda ash. This removes most of the color from the goods and insures level dyeing. If, as is usually the case, ordinary direct cotton dyes are used, drying becomes somewhat of a problem. A salt addition to the final rinse, very complete hydro-extraction, and a rapid drying at a fairly high temperature are all necessary to prevent swailing in this type of goods.

Ladies' silk dresses and skirts cause more trouble than any other class of work. This is due, not to

difficulty of dyeing, but to extreme difficulty of proper cleansing before dyeing. The source of the trouble is albuminous matter which does not show when the garment is given to the colorist, becomes coagulated by the boiling batch, and absorbs a large amount of color resulting in a dark spot in the garment. To prevent trouble from this source it is necessary to soak the garment overnight in cold water and wash it very thoroughly in warm (100 deg. Fahr.) soap and water before dyeing. If possible the wet garments should be spread out on a smooth surface and brushed with soap and water before rinsing.

Dyeing Dresses

These garments are usually dyed by entering the goods into a boiling dye bath and running at a weak boil ten minutes, or until the desired shade is reached. The quantity of dye in the bath is usually several times the amount that is taken up by the dress. Direct cotton colors, acid colors, and occasionally basic colors, are used.

Special care must be taken not to jam the garments between the stick used to turn the goods and the kettle. Should this happen a shiny spot is sure to show up on the finished goods. Such shiny spots can be covered up by lightly brushing the spot with a rag moistened with gasoline to which a small amount of oil has been added. The gasoline evaporates, leaving a very small quantity of oil behind which will not show but successfully hides the spot.

Should stains from albuminous matter show on the garment after dyeing it will be necessary to wet the garment, spread it on a flat surface, and brush the spot as vigorously as possible without injury to the goods until the spot is gone. It will then be found necessary to redye the garment. A fairly stiff root brush should be used, although in a pinch a flat tooth brush will do a very satisfactory job.

Before accepting a garment for dyeing one should always be very careful to warn the owner that too much must not be expected. Thin places should be pointed out, excessive fading shown up, and owners of loose woven woolens should be warned of shrinkage. Above all, it should be clearly understood that the owner assumes all risk.

A Contribution to the History of the Development of the Chemical Methods of Finishing in the Cotton Industry

By A. BODMER

(Translated from Melliand's Textilberichte)

IN the past, the cotton finishing industry was principally occupied in taking the products of the spinning frame and loom and converting them into a marketable condition through bleaching, dyeing, printing and finishing, without altering the basic fiber in any way. The tendency has always been to convey to the cleaned and dyed cotton the appearance of more valuable material.

Attempts were made with more or less success in influencing the goods through the nature of the finish, either by the application of finishing substances, by pressing, calendering or roughening. But in spite of all these processes, the cotton fiber retained its original properties, and a single washing was usually sufficient to cause the best effects obtained in finishing to disappear.

In the last thirty years a number of new processes of great importance have been brought forward; they aim to permanently change the cotton fiber by chemical means. The credit is due to John Mercer for first recognizing the importance of a chemical reaction with cellulose. However, it remained for Lowe and Thomas and Prevost, independently of one another, to discover that Mercer's caustic soda treatment was able to produce a permanent silky luster on stretching the cotton material, a process that revolutionized the cotton industry. With the general introduction of the mercerizing process, the development of chemical methods of finishing came to a standstill, until the beginning of the present century, when the application of strong acids on cotton was brought into use, a reaction of great importance for the finishing industry.

Mercerization and Acid Treatment

Recently a number of valuable articles have appeared in the technical literature which discuss from various angles the connection between mercerizing and the newer finishing processes.

New achievements in the industry have their forerunners, and even our case is no exception. The classical patent of Mercer of 1850 states that the swelling of the cotton fiber by means of caustic soda can also be obtained by treatment with sulphuric acid. Mercer assumed that these two reactions were identical, an assumption that was believed in for over half a century.

This idea is still to be found in some text books; there-

fore, it is to the credit of Prof. Krais for his recent work[1] in making clear the difference between mercerization and acid treatment. Formerly nobody cared to have anything to do with concentrated acids on cotton, as the risk of destroying the fiber was too great. It appears that formerly this reaction was of theoretical interest only, and merely served the purpose of protecting the first mercerizing patents against infringement. The Depouilly brothers in the same manner[2], included the acid in the well known crepe patent, as did Thomas and Prevost in their supplementary patent[3].

The first real progress at attempts to improve by means of acids was made by Thomas and Prevost in 1900. They applied for a patent[4] for a process for the production of a permanent finish by the use of gelatinizing materials, including strong inorganic acids, followed by mercerizing. This process does not appear to have been introduced into practice.

In the same manner, the Bemberg process[5] has remained a child of the laboratory, since the oxidation of the surface of the cotton did not allow the further treatment of the fiber with alkalies or acids without damage.

Mercer's observation of the swelling action of acid on cellulose, in the meantime, had spread into other branches of industry. Through the work of Poumarede and Figuier[6] in 1846, it was found that the swelling of paper with concentrated acids produced a new substance, now known to the trade as parchment paper. This fact led the firm of Heberlein & Co. (of Germany) in 1900 to the idea of applying this principle to cotton fabrics, and in place of paper, to parchmentize the fabric. Long experiments produced results of considerable interest. As was expected, a stiffening of the fabric resulted, and it was also observed that the individual threads became thinner and more transparent. In the same year, goods finished in this manner appeared in the market under the name of "Universa." The fact that at that time the embroidery trade was favoring an organdy finish, that is, a semi-transparent, stiff, but elastic starch finish on fine fabrics such as mousseline and batiste, was responsible for the new article finding great favor. The former designation was soon dropped and the name changed to "Wash-Organdy," due to the great similarity. From the beginning, it was observed that not only acids, but a combination of acid treatment with mercerization produced useful effects. This new fabric was prized on account of its transparency, and it is still being marketed under the name of "Transparent."

Damask Effects

The result of these new processes caused Heberlein & Co. to place the entire question of acid finishing on a systematic basis. The first fruit of their further attempts resulted in a process[7], whereby through partial parchmentizing in combination with mercerizing, apparently by printing, patterns could be produced on woven fabrics. The result of this process is that the lustrous, mercerized parts stand out from the dull transparent ground (damask effects), and this contrast is still further increased by dyeing, whereby the transparent parts dye much deeper than the rest of the fabric. Goods of this type have been introduced under the name of "Imago-transparent."

The more exact study of parchmentizing should, however, lead to further discoveries. Although it was long known that sulphuric acid of certain strengths (the older recipes varied from 45 to 55 deg. Be.) had a parchmentizing action in a few seconds, it was found that weaker acid, which even after fifteen minutes action had no apparent outward effect on the cotton, did effect the tinctorial properties of the fiber, and Blondel[8] proposed, as a result of this property, a dyeing process for Methylene Blue.

Heberlein found that sulphuric acid of less density than 51 deg. Be. produced remarkable changes in cotton fibers previously mercerized. A noticeable shrinking of the fiber took place, the fabric became thicker and took on a slight crepe effect. Especially remarkable was the fact that the streakiness due to the structure of the fabric had disappeared, whereby the uniformity of the fabric was improved to a high degree. At the same time a matte, milky appearance was obtained, resulting in this new article being marketed under the name of "Opal."[9]

Later, the transparent fabrics described above were considerably improved in transparency and uniformity through repeated mercerization and acid treatment.[10] Under certain conditions, this process lends itself to the development of original effects that combine the milky structure of the Opal effect with the transparent, stiff nature of the Transparent, and also allows the production of intermediate effects.

Effects of Other Acids

The effect of acids other than sulphuric acid on cotton cellulose has also been observed. It was found that phosphoric, hydrochloric, and nitric acids behave in a similar manner, and again it depends on certain concentrations, some producing a thickening of the fiber similar to the Opal effect, other strengths having a parchmentizing action.[11] Other substances having a swelling action, for example, zinc chloride and copper oxide-ammonia, etc., have been found useful for the production of the same effects.

The peculiar behavior of nitric acid deserves further mention here. While the swelling agents, if not carefully controlled, lead to the disintegration of the cellulose, this is seldom the case with nitric acid. The absence of hydrolysis is obviously a specific action of nitric acid and is closely allied to the formation of esters of cellulose. In contrast to the work of Dr. Beils[12] on the behavior of the products of the so-called Philana process, it was observed that fabrics prepared by the Heberlein method contained measurable quantities of nitrogen in the form of nitrate. This finish produced by Heberlein under the name of "Hecolan" is covered by D. R. P.

292,213 and is representative of the "woolenizing" effects obtainable.

The preceding work makes no claims for completeness and is merely meant as a review of the development of the interesting chemical finishing processes for cotton, with the hope that it is a beginning towards further work in this direction.

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Two new members elected to the Silk Association of America, Inc., by its Executive Committee are Foremost Fabrics Corporation, broad silk manufacturers, with N. J. Ginsburg, vice-president, and Commercial Fibre Company of America, raw and converted rayon house.

LARGE ITALIAN DYE CONCERN HAS GOOD ANNUAL REPORT

The annual report of the Fabbriche Italiane Materie Coloranti Bonelli, Milan, one of the most important of the Italian dyestuffs manufacturing concerns, for the year ended June 30, 1926, was presented at the general assembly of the company, held September 30, and was published in 'Il Sole" of November 2, according to advice from E. Hames, Research Assistant, Rome.

During the past year the company was able to carry out in full the program mapped out at the general assembly of 1925. This program included a heavy outlay of money for expansion, among which may be mentioned six million lire spent for the new synthetic indigo plant; two million lire for the manufacture of monochloracetic acid; two and one-half million lire for the large sodium sulphate, sodium sulphide and hydrochloric acid plant, and about three million lire for the purchase of equipment and machinery and for the building of new constructions for the acetic anhydride and cellulose acetate plants. In addition to the above, about twenty million lire were spent in building houses for employees of the company and in putting up storehouses, warehouses, electric power houses, boilers, tracks, etc., and in the extension of the already existing plants.

From the industrial standpoint the year has been a satisfactory one, both as regards the quantity and quality of the products manufactured. As regards the commercial results of the year, the demand was active during the first six months of the campaign, but, owing to the critical condition of certain branches of the textile industry, a slackening in the market demand was noted during the last six months. In spite of this fact, an increase of 10 per cent is regarded in sales as compared with the previous year, although sales of Sulphur Black, one of the most important products, were considerably reduced during the year. The Italian dyestuffs industry has found itself in a particularly difficult position owing to the abundant supplies on the Italian market, at low prices, of German dyestuffs furnished on account of reparations. This unfavorable condition had an adverse influence on the sales of the synthetic indigo produced by Bonelli Company, but during the last months of the year the market has begun to absorb the domestic indigo as well as could be expected in view of the doubtful condition of the textile industry. At the same time the Bonelli Company is making efforts to find an outlet for this product in foreign markets.

Rapid Identification of Color Lakes

Results of a Study in Which Known Samples of Color Lakes Were Subjected to a Number of Reagents as a Means of Identifying Color Lakes

By SAUL ROBINSON

IN order to afford a rapid means of identifying the color used in the manufacture of a lake made with a coal tar color, known samples of color lakes were subjected to the following reagents as given in the tables on the opposite and following pages.

The reagents used were:

1. Sulphuric, Conc.—Upon about 3 c.c. Conc. Sulphuric in a porcelain dish, sprinkle a pinch of the lake.

   Sulphuric Dilute.—Dilute the above after the color has developed with about 5 c.c. water.

2. Hydrochloric, Conc.—As under 1.
   Hydrochloric, Dilute.—As under 1.

3. Alkali—Use 3 c.c. of a 15 per cent sodium hydrate solution.

4. Alcoholic Potash.—Use about 1 c.c. of a half normal alcoholic potash solution in a small porcelain dish or on a watch glass.

5. Sublimation.—Heat some of the lake gently in a porcelain dish, covering the dish with an inverted watch glass. As soon as the color starts to a sublime, remove the flame and allow the color to sublime on the glass. When cool, remove watch glass and test color reaction with a drop of the reagent.

RED LAKES

Lake	Sulfuric Acid		Hydrochloric		Alkali	Alcoholic Potash	Sublimate
	Conc.	Dilution	Conc.	Dilution			
Amaranth	BL	Rose R	Rose R	Rose R	No	RBr	No
Lake Bordeaux	Bl	" "	BlR	" "	"	"	"
Autol	Bl	R prec.	" prec.	LBl R	"	"	R
Fuchsine	Br	Y	O	LY	RBr prec	"	No
Alizarine	" R	Y	Br prec.	Br Prec.	No	No	No (1)
Red C	Rose R	OY	No	No	No	RBr	No
Red D	" "	OY	Maroon	No	No	Y	No
Perm. Red 4B	" "	R	"	Pink	No	Br	Y slightly
Para Nitraniline	" "	OY	No	No	No	deep Wine R	OR (2)
Lithol Rubine	R	Pink	Pink	Pink	RBr	RBr	No
Lithol	VR	Maroon	Maroon	No	No	RBr prec.	Deep R
Perm. Red R	RV	YO prec.	No	No	No	Bl	O
Red P	RV	R	No	No	Pink	Pale RV	No
Para Toluidine	RV	O	No	No	No	No	OR (3)
Pig. Scarlet	OR	O prec.	No	No	OR	RBr	No
Eosine	OY	YO	OY	OY	Pink	Gr Fluor-escence	No
Rhodamine	Y	O	O	Rose R	Rose R	Pink	Pink

(1) Boil with strong hydrochloric, filter, wash, dry. Sublimate gives a violet color with ammonia. (2) Sublimate gives a violet with sulphuric acid. (3) Sublimate gives a blue with sulphuric acid.

Bl—blue; Br—brown; D—dull; Gr—green; L—light; O—orange; R—red; Y—yellow, sol.—solution; prec.—precipitate.

YELLOW LAKES

Lakes	Sulfuric Acid		Hydrochloric Acid		Alkali	Alcoholic Potash	Sublimate
	Conc.	Dilution	Conc.	Dilution			
Naphthol Yellow	Y	LY	LY sol. DY prec.	LY	Y	Br prec.	No
Tartrazine	Y	LY	" "	LY	Y	Br Prec.	No
Lake Yellow 2G	Y	Y	Y	Y	Y	Y	No
Pig. Chlorine	DBr	LY	Tan prec.	Tan prec.	No	Tan	Y
Hansa Yellow	YO	Y	No	No	No	OBr	Y

On reduction test: Naphthol Yellow reduced to Red, changing to Yellow; Tartrazine reduced completely; Lake Yellow reduced completely; Pig. Chlorine not reduced; Hansa Yellow not reduced.

To perform the reduction test, add a small amount of the lake to 10-15 c.c. sodium carbonate solution (2 per cent). Heat to boiling, and then add a small amount of sodium hydrosulphite.

ORANGE LAKES

Lake	Sulfuric Acid		Hydrochloric Acid		Alkali	Alcoholic Potash	Sublimate
	Conc.	Dilution	Conc.	Dilution			
Orange I	Rose R	OY	R	Y	RBr	Br	No
Orange II	" "	OY	R	Y	RBr	Br	No
Pig. Orange	" "	O	Violet prec.	Pinkish	No	Br	No
Meta Nitro-aniline	" "	Y	Pink	Y	No	Br	Y
Perm. Red 2G	RV	Y	No	Pinkish	Y	Bl	Y to OR
Lithol Red R	Dull Purple	Pale R	No	No	No	Br	No
BLUE, PURPLE, VIOLET LAKES							
Alizarine Purple	R	Y	Rose R	Rose R	Bl	Bl R	
Alkali Blue	RBr	Deep Blue	Gr	Bl	No	O Br	
Erio-glaucine	YBr	Y	Y	Gr	No	Bl Gr changing to sol.& Gr prec.	
Patent Blue	Gr	LGr	Y	LGr	Gr Bl	as Erioglaucine	
Methyl Violet	YBr	Gr Y	Y Br	DGr	No	Pink sol. & Maroon prec.	
Victoria Blue	Br	Bl Gr	Br	Bl Gr	No	Wine Red	

DYED FURS TO BE NAMED CORRECTLY

No longer will muskrat masquerade as sealskin nor goathair assume the leopard's noble name. Fur dyers have agreed to name the pelts, and in this decision they are supported by other groups in the fur trade.

A campaign for more ethical practice in fur merchandising, sponsored by the National Better Business Bureau, won the wholehearted approval of the National Association of the Fur Industry and the representatives of this latter association recently met with the Better Business Bureau to hear a discussion of the Bureau's recommendations on the naming of furs. Fur dyers and finishers were invited to listen in on the conference.

"Fundamentally, there was no difference of opinion expressed," declared B. L. Shinn of the National Better Business Bureau, who presided. "The bureaus explained that in their opinion the time has come for the finishers of skins to correct the nomenclature and abolish all ambiguous terms. The fur men gave approval of our stand that the public is entitled to know what skins it is buying. The group also approved of suggestions whereby muskrat dyed to simulate sealskin shall be advertised as 'seal-dyed muskrat.' Similarly, if rabbit skin is dyed to look like sealskin, it should be advertised as 'seal-dyed coney.'"

David C. Mills, General Director of the National Association of the Fur Industry, and Vincent Gilroy, its counsel, were appointed to examine with Business Bureau representatives all fur advertising now used by member firms.

Harry F. Keenan, who recently resigned as overseer of finishing at the Whitestone Dye Works, Whitestone, L. I., N. Y., has perfected a process for finishing worsted jersey cloth. It is called "Tru-Form," and eliminates sagging in this fabric. The process has been assigned to Cornellist, Inc., Astoria, L. I. Mr. Keenan is now superintendent of this plant.

Effects of Ironing and Steaming on Cotton and Wool

The Effect of Ironing on Fastness—Color Phenomena Due to Moisture—Steaming and Decatizing—Its Influence on Handle and Milling Properties—Sun and Air Effects on Wool

DYEINGS on cotton are particularly liable to have to be fast to ironing since they are in so many cases washed and rewashed, and have to be also ironed each time that they are washed. In the case of wool dyeings, these, generally speaking, receive their main ironing influence immediately before and after making them up into garments, not to any really great extent afterwards. There is not usually any serious likelihood of fault-finding as regards lack of fastness of wool colors on woolens and worsteds. The effect of the iron here is usually more to be seen in the effect on the material itself, that is as to whether the material shrinks or not, or whether (this is really a case of local shrinkage) the wool cloth cockles. In the processing of the woolen goods the possible effect of the ironing may be counteracted by the decatizing operation, where a permanent finish is given and satisfactory resistance to the iron or cockling is produced. London shrinking should absolutely insure no shrinking under the iron or in any other way.

In the case of cotton goods the effect of the iron is not so much the influence of the iron on the material as upon the dye on the fiber. In some cases in wool dyeing the iron will cause volatilization of the color, as is to be seen in some of the acid oranges and the heat influence will also be seen (but not actual volatilization perhaps) to a marked extent in some of the brighter colors, bright violets, etc. Sometimes a somewhat similar effect is seen after drying and perhaps steaming pieces, both wool and cotton, or merely drying pieces and then allowing them to lie about. The outer edges of the pieces coming into contact with the atmosphere, will naturally be able to take up atmospheric moisture, while the inner folds are left out of contact with the air and causes the edges to give a different shade to the other parts of the piece. Sometimes, due to this taking place, and by no means infrequently, pieces are mistakenly thought to be listed. Some dyes show the phenomenon to a marked extent and are doubtless the cause of much controversy.

Moisture and Color Phenomena

Some similar effect is often seen in the case of some of the direct cotton violets on cotton. There are not many such violets to be had for the dyeing of cotton and they are well known as showing this change in shade, which is due to very small differences in moisture content between one part of the piece, or yarn, and another. Such effects have often been the cause of doubt as to whether the materials were dyed level or not. Other cotton goods show the effect to a less degree.

The effect of moisture on colors is curious in many ways. Very often in the dyeing of wool as the moisture content increases the shade appears darker but in some cases, notably in the case of indigo dyed material, the shade under the influence of water-vapor becomes lighter.

We are not troubled to-day to any marked extent with fastness to ironing, where actual volatilization of the dye takes place as a result of ironing.

Ironing Damp

There is, of course, a difference in the type of ironing commonly carried on. Some may be employing for their purpose what we should call a dry ironing operation, while others may have the material wet, and these two differences in the ironing operation affect colors differently. Most colors on cotton are fast to the dry iron, whatever the class be to which they belong, that is as to whether they are direct cotton dyes, sulphide, vat or basic. In the case of certain of the otherwise fast vat dyes, curiously enough, a temporary change in shade is to be noted, as is also with Para Red, under the influence of the hot iron. When the ironing is carried out damp, the ironing effect is more severe, and in the case of some of the direct cotton colors there may be a risk on cotton of the staining of contiguous whites. The diazotized and developed colors are much more satisfactory in this respect than the straight direct dyes, while the basics are quite good as a class and the sulphides excellent, but again the vat dyes have just a few examples among the violets which alter their shade for a brief period when ironed damp. This is, however, purely a temporary phase probably dependent on the amount of moisture in the goods as controlled by the hot iron or the surrounding atmosphere.

Steaming and Decatizing

Wool is the most sensitive of all fibers to the action of steam. At the boiling point of water, namely at 212 deg. Fahr., wool becomes plastic and repeated steaming tends to diminish the strength of the wool and finally lead to disruption in both the acid and the alkaline phase. The steaming here referred to by K. Wagner in the Textilberichte, is evidently that part of piece goods treatment, of worsteds chiefly, where the pieces are rolled on to

perforated cylinders, with or without wrappers, and steam either blown or drawn through them.

If goods are given, for some reason or other, too great a steaming, then there is greater resistance shown to milling. The milling properties of the fiber are lessened. Repeated steaming also may lead to permanent creases in a cloth or may even lead to tearing. In practice there is, on the face of it, no reason why goods should receive an excessive amount of steaming; certainly not so much as to cause creases in them that may be considered as permanent. The point concerning the decrease in the power to mill satisfactorily a cloth which has been oversteamed is of both practical and theoretical interest, although here again there is no reason why goods should be given repeated steamings. One, or two at the most, should be quite enough. It may be of interest, however, to the practical man as to whether certain cloths which have to be milled would be better without the steaming, in view of this decrease in milling ability, but where goods are milled as well as, say, crabbed, they may be given that further steaming process to effect a better setting of the material, in order possibly to give greater firmness to the cloth as well as to insure that the cloth will not be so liable to mark in the subsequent scouring and milling operations.

Where the cloth has been for special reasons decatized two or three times the point as regards milling powers of the fibers is not of interest, since such cloths are well passed the milling processing.

Wool in the Alkaline Phase

Another point brought forward is that entirely neutral wool in its original condition must be regarded as being in the alkaline phase, in harmony with the amphoteric basic character of the fiber with its mainly alkaline properties. In the same way wool which has been put through the various manufacturing processes, such as scouring, neutral dyeing, etc., and is still in the alkaline phase, has an enhanced tendency to show the ugly glaze instead of the highly-valued dull luster, and in addition there is a deterioration in the handle of the material. The change in molecular structure has proceeded so far that the fiber has hardened and is brittle, but an alteration in character to this extent can almost entirely be avoided by steaming in the acid phase.

Sun and Air Effect on Wool

Some experiments were carried out in Germany by A. Kertess during the latter war years and immediately after the war was over and some useful results were obtained regarding the breaking up of the wool fiber as a result of exposure to the atmospheric action, sun, and air, etc. The Chemiker Zeitung publishes further work by the same author on this matter and his earlier conclusions have been confirmed.

Of the five samples of cloth taken and exposed one was a natural white wool and the other four were of field gray army cloth, and after exposure, in appearance, microscopic as well as ordinary, there was no appreciable difference to be noted in the construction of the fibers. They were, however, found to be very brittle, and when they were mounted they crumbled into very small particles. Evidently the atmosphere and sun had produced a chemical degradation of the wool substance as had been found to take place in previous experiments. It is, of course, well known that in dyeing faded materials, there is usually difficulty in many cases in getting level results again, due to the different dyeing properties of the various parts of the material which have been naturally exposed to a varying extent in the different parts of the same garment.—The Textile Argus.

DECREASE IN WOOL SCOURING LAST YEAR

The Department of Commerce announces that, according to data collected at the biennial census of manufactures, 1925, the establishments engaged primarily in the scouring, sorting and carbonizing of wool reported products valued at $5,831,480, a decrease of 28.8 per cent as compared with $8,190,091 in 1923, the last preceding census year.

Most of the establishments in this industry are engaged primarily in the scouring, sorting, and carbonizing of wool owned by others, but a few of them perform these processes on purchased wool. To a large extent this work is done in the same establishments in which the wool is manufactured into yarn or cloth, but the work performed in such establishments is not represented in the statistics for the wool-scouring industry.

Of the twenty-five establishments reporting for 1925, twelve were located in Massachusetts, four in Illinois, three in California, and the remainder in six other States. In 1923 the industry was represented by twenty-six establishments, the decrease to twenty-five in 1925 being the net result of a loss of four establishments and a gain of three. Of the four establishments lost to the industry, two had gone out of business prior to the beginning of 1925, one was engaged primarily in the processing of waste and was therefore transferred to the proper industry, and one reported products valued at less than $5,000. (No data are tabulated at the biennial censuses for establishments with products under $5,000 in value.)

BELGIAN EXPORTS OF CREOSOTE

Belgium is a large exporter of creosote oil, the United States taking approximately 96 per cent of shipments sent out of that country. Small amounts of this commodity are imported into Belgium, most of which comes from Germany. The local consumption of creosote oil is almost entirely for the preservation of railroad ties and telegraph poles, Government owned projects, and the work of applying the creosote is done at the Government factories at Ghent and Ostende.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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SIXTH ANNUAL MEETING

The first annual meeting South, marking the Sixth Annual Meeting of the American Association of Textile Chemists and Colorists, officially opened at the Charlotte Hotel, Charlotte, N. C., Friday evening, December 3. The previous day, however, and Friday morning and afternoon, the members, in three parties, visited mills in the textile districts of Greenville, S. C., Greensboro, N. C., and Charlotte, N. C.

That it was by far the most interesting and instructive annual meeting ever held by the Association was practically the unanimous opinion of those who attended. Southern hospitality is almost proverbial, but in planning the program of this meeting the members of the Southern Section gave their fellow-members from the North an entirely new conception of what a Southern visit can be.

The side trips to the textile mills in the surrounding vicinity were unquestionably one of the most enlightening features of the Southern meeting. In the last few years the South has strode forward rapidly in textile manufacture; it is still moving ahead and its inhabitants are justly proud of what they have accomplished. Everywhere the members felt with noticeable pleasure this undercurrent, a pride in the achievements of a great industry. Those who were guided through the large mills in Greenville, Spartanburg, and other textile districts, saw, in the fine new plants that were being built or in operation, in the very efficient way those plants were being run, in the unusual character of the operatives, who were all skilled, trained natives of the South, that the Section's pride in its fast-growing textile industry was entirely warranted.

TRIPS TO SOUTHERN MILLS

The party that gathered Thursday morning, December 2, at Greenville, were first entertained at a luncheon given by the city's chamber of commerce at the Poinsette Hotel, and then, in three groups, visited the Judson Mills, the Franklin Process Company and the Union Dyeing & Bleachery Company in Greenville. The groups met at the last-named plant and together were taken to the Southern Worsted Mills, to the Pacific Mills at Lyman, then to Spartanburg, where they were the guests of that city's chamber of commerce at an enjoyable dinner arranged under the direction of Leonard S. Little, Chairman of the Southern Section. On Friday morning the Greenville party traveled by motor bus to Gaffney, there saw the Irene Mills, and after a lunch at Gaffney, went on to Belmont to the mercerizing plant of the Belmont Processing Company. At the Belmont mill this party met the group that had left Charlotte in the morning.

The Charlotte party met at the Hotel Charlotte, Friday morning, and went by motor bus to the Highland Park Manufacturing Company. Here they were taken on a most instructive tour of the entire mill, starting at the

cotton picking room and taking them through every department, from the carding, winding and weaving to the dyeing and printing of warps and the finishing of the completed fabric. Their visit culminated in a motor trip around Charlotte, and an excellent luncheon given in their honor by the Charlotte Board of Trade.

A third group of members, meanwhile, had gathered in the early morning hours at Greensboro, N. C., and after a breakfast at the O. Henry Hotel, scene of the famous writer's early days, were taken by bus to the Proximity Mills. They were shown about this remarkable denim plant by a very able guide, Mr. Hardin, who pointed out that the mill was situated in its own little village which contained stores, a church, a theater and other features of a residential town.

The next point on the itinerary of the Greensboro party was the Proximity Printing Works, noted for its large production of whipcord and ticking. After the inspection of this plant the party was taken by Mr. Hardin to the White Oak Mills, also part of the Proximity group. Of special interest here was an extraordinary weaving shed where in one room, 1,500 feet long, 3,000 looms were in operation, roaring like a cataract. Each guest, as the party left the mill, was presented with a handsome volume describing the mill's operation and products.

This party, too, were the guests of the Southern Section at a luncheon in the Hotel Sheraton at High Point, and were then taken to Salisbury to inspect the mill where the famous B. V. D. cloth is made. The mill's production also embraces a full line of sheetings and pillow slips. It is equipped like the Proximity Mills, with its own hypochlorite plant.

All members gathered Friday evening in the Hotel Charlotte to attend the Open Forum, Buffet Lunch, Smoker and Entertainment. At the Forum considerable discussion was devoted to the fastness of dyes to light and the testing of dyestuffs. The full report will appear in the next issue of the Proceedings.

The Annual Business Meeting was held Saturday morning, December 4, at the Hotel Charlotte.

Following the announcement of elections the various subcommittees of the Research Committee presented their reports, outlining the progress made in the establishment of standard tests for fastness to light, washing and other agencies. W. D. Appel, of the Bureau of Standards and member of the Research Committee, delivered a special account of the valuable research work that has been accomplished at his Bureau in co-operation with the Research Committee.

Presentation of the following papers comprised the full technical program of the Saturday morning session: "Scouring, Dyeing and Bleaching of Cotton Which Has Been Treated with Oil Spray," by Prof. A. H. Grimshaw; "Difficulties Encountered in Dry Cleaning Textile Fabrics," by L. E. Jackson; "Physical Problems in Textile Research," by Chas. F. Goldthwait; "Dyeing of Union Shades on Hosiery Containing Rayon, Pure Silk and Mercerized Cotton," by Chas. B. Ordway.

After a luncheon at the Chamber of Commerce the technical session was resumed in the afternoon with presentation of the following papers: "Modern Theories of Dyeing," by R. E. Rose; "Vat Dye Development in America," by P. H. Stott; "The Chemical Constitution and Fastness Properties of Colors," by Berthold Wuth; "Solvents Made by the Hydrogenation Process," by E. H. Killheffer, and "Printing and Discharging of Color on Celanese," by Wm. Milne.

The full report of the banquet held in the evening follows.

[NOTE.—*The Proceedings of the Open Forum and of the Saturday Technical Sessions, which had to be edited more carefully, will appear in full in the next two issues of the Proceedings.*]

SIXTH ANNUAL BANQUET

Saturday Evening, December 4, 1926

The Sixth Annual Banquet of the American Association of Textile Chemists and Colorists was held in the ballroom of the Charlotte Hotel. Leonard S. Little, Chairman of the Southern Section, made a short address of welcome and introduced Stuart W. Cramer, president of the Cramerton Mills, Inc., who presided as toastmaster.

Toastmaster Cramer introduced Edwin Farnham Green, treasurer of the Pacific Mills, Boston, who addressed the banquet on the subject of "The Textile Chemist." His address follows.

The Textile Chemist

By EDWIN FARNHAM GREEN

Mr. Chairman, I am very sorry to interrupt the meeting and disarrange your program in this way; but I wanted very much to be here this evening, and I had also previously accepted an invitation which made it necessary for me to leave on the 8.25 train. But I am very sincere when I say that I consider this a peculiar pleasure and a very great opportunity to come here this evening and address those who are interested in what I might term the scientific, chemical side of our industry.

A great deal of attention has been paid during the past few years to the rearrangement of machinery and the upbuilding of our plants, and in recent years you have heard a good deal about merchandising research. In fact, perhaps the greatest emphasis during the past few months has been placed on the question of selling of textile products. But I am very glad to come here

to testify to the importance of the textile chemical end of our business.

There is absolutely no question but what this presents a very great opportunity to those of us who are assembled in this room to-night; in other words, those who are interested in the more scientific side of the business.

I don't need, of course, to tell you of the many ways in which problems are presented to the textile chemists and the many opportunities which you have to work along the very lines which lead to success or perhaps lead from failure to success, under present conditions.

The changing styles, fads and fancies, chiefly of women, have presented many serious problems. The demand for something different, the demand for something better, has made it an important question for all of us to consider what improvements can be made in our machinery, in our manufacturing processes and in our merchandising; but I, for one, believe that perhaps the very greatest opportunity is open to you who are interested in this special side of the business.

The Pacific Mills has been trying to do its part. I hesitate to say much about what the Pacific Mills is doing, with these gentlemen sitting right in front of me who know far more than I do. In fact, Mr. Moran, our chief chemist, is one of the men who gave me most of the information that I have in regard to what the Pacific Mills is doing, although I do attempt to keep in touch with it myself; but, as a matter of fact, we have reorganized all of our chemical work during the past few years, and even during the past few months, and if I speak too much of the Pacific Mills just bear in mind that I am using that great corporation as an illustration of what the textile industry is trying to do along this very line.

Mr. Moran, as chief chemist, is the head of our chemical division, and under him we have divided the work into three great departments relating to dyeing and printing, general chemistry, and the worsted department.

Research Fellowships

In these departments are men, of course, of varying experience. One change we have made is that we have allowed far more opportunity for individual research. In other words, in the old days I think most of the concerns hired a chemist to do testing and to just look out for routine work. To-day we are attempting to give the men who have imagination, ability, training and experience enough time so that they can use their imagination and work along the very highest lines of scientific research for the benefit not only of the Pacific Mills but of the whole industry.

This is one of the important steps that we have taken. Not only are we training young men in our own laboratories in a practical way, but we are also attempting to check up—in a modest way, to be sure—with some of the great universities. We have at the present time a man at Cornell who is on a research fellowship which was given by the Pacific Mills. He is working under one of the great leaders there, and when he finishes his course he will come into our organization. Recently a man completed a course at Yale, where he worked on problems relating to this industry; but he had been working, frankly, at our expense, with the idea of coming into our organization when he completed his course.

In that way not only are we bringing young men who have had training into our organization, where they are gaining practical experience, but we are reaching out into some of the universities and institutions of learning to stimulate the interest of those men in the problems which lie before them in the textile field.

We are meeting to-night in the Southland. No one, I think, is more interested in the development of the textile industry—I say *more interested*—in the South than I am, and the Pacific Mills has done a great deal in developing the textile industry here. We are not pioneers or leaders in any sense, but we have enough faith in the development of that end of the business, that is, the finishing end of the business, to establish the nucleus of a great finishing plant at Lyman. Some of you I think honored us by visiting the plant Thursday afternoon. We are, at that plant, just beginning to do simple bleaching of narrow goods and of wide goods, and also manufacturing sheets and pillow cases, but the experience which we have gained there and the results which we have accomplished already indicate that we can go very much further in the finishing of goods.

Opportunities in the South

Of course, it is perfectly true that the larger finishing plants, those who do perhaps the greatest variety of work and for many years the better quality of work, are located in the North, but I have no hesitation in saying that I believe the finishing business will grow and develop in the South, and I see no reason why there should be any limitation put on its development.

I will mention one little item for example. There is a misconception in regard to the water of the South. I have heard man after man in the South say that the water of the South isn't suitable for bleaching, but there is absolutely no question, based on experience (not only our experience but the experience of many others) that the water through this Piedmont District, once it is fil-

tered, is even better than the Merrimac River water, which is saying a good deal.

So that, after all, in the matter of physical equipment (because the plants are few), in the matter of operatives, in the matter of water, and all the fundamental questions —the cheapness of fuel, and in many other respects— the South is very well fixed to encourage the development of the finishing end of the business and I look for a gradual but a very steady growth along these lines.

As I say, I have esteemed it a pleasure to be here. I am only sorry that I cannot show more consideration to you, although I shall show consideration in the briefness of my remarks. But it has been an extreme pleasure to be here because I, personally, and the great corporation which I represent are tremendously interested in the problems which you all are working on, and I only hope that through the Cotton Textile Institute, which is represented here to-night by one of its vice-presidents, and through your Association, and through the co-operation of the great manufacturers of dyestuffs and the great corporations, themselves, in the business that we will find some way of still further stimulating scientific research along the lines of textile chemistry.

I appreciate very much the opportunity of being here and you have my very best wishes in the many problems and interests which lie before you. Thank you. (Applause.)

Toastmaster Cramer—I wish to thank Mr. Green and to express the regrets of this body, I am sure, at the brevity of his remarks because, really, if he could have taken a little more time I am sure it would have been well worth our while.

Gentlemen, we will proceed with our dinner and then the other speakers will follow.

. . . . . .

Toastmaster Cramer—I should like to take just a moment to tell you that I made it my business to come here, not only because I was honored with an invitation from you to become your Toastmaster but also because I wished to appear representing the Cotton Textile Institute and to say just a word about that, merely to assure you that we look forward with a great deal of satisfaction to co-operatively working with you. We mean to draw into that organization, in an affiliated way, every one who can contribute anything toward the success of the cotton industry and I am sure that puts you people pretty well up in front.

In the second place, I happen to be the joint president of the National Council of the Northern and Southern Association of Cotton Manufacturers, and perhaps I might add a word of greeting from them.

I should like to say more but we have several speakers here, who *are* speakers, and so I shall go ahead with the program.

Before doing so, however, I should like to read you a telegram from Governor McLane of North Carolina:

"I regret exceedingly impossible to attend American Association of Textile Chemists and Colorists' banquet to-night. Important matters require my remaining here. Greetings."

I might also say that ex-Governor Morrison of our State intended to be here to add a word of welcome, but something prevented him from doing so; I don't know just what. I know it must have caused him distress; because, in the first place, he is a good talker, and, in the second place, he likes to talk. (Laughter.)

I know by this time you are all quite convinced that you are welcome. It hardly seems necessary to have an address of welcome. Yet there are certain formalities in the way of hospitality that must be observed, and David Clark is going to tell you how welcome you really are.

Address of Welcome

David Clark delivered a most interesting address, heartily welcoming the members of the Association to the South and aptly expressing appreciation of all that the textile chemist has been doing for the development of the textile industry in the South.

He then spoke on textile conditions that are making for Southern prosperity, stating that mills are not moving to the South because of any extraordinary advantages in the working hours or in child labor, for there is actually but slight difference in these conditions between the South and New England. He declared that, if anything, the growth of the Southern textile industry was due directly to certain definite economic factors. Southern climate, he said, exerted a distinct effect on such items as consumption of fuel and amount of clothes and food required by mill operatives, and that the very clear differences in the cost of living and related conditions were the real cause of any Southern migration.

In closing his address Mr. Clark optimistically predicted an ever-increasing activity in the cotton industry of the country, since there has actually been, he said, a decided increase in the consumption of cotton during the past quarter century. He said in part:

"In 1900 the per capita consumption of cotton goods in the United States was fifty-five square yards. In 1910 it had risen to sixty-three square yards. In 1923, which is the latest statistics we have from the Government, the per capita consumption of cotton goods was seventy-two and five-tenths square yards. In other words, instead of having a decrease in the consumption of cotton goods per capita in the United States

we have increased it more than thirty per cent since 1900, actually.

"The statement is also made that we have too many mills. In 1910 we were operating three hundred and eight spindles per one thousand population. During the first part of this year we were operating three hundred and two spindles per one thousand population. We have not increased our spindles out of proportion to the population. Nor has the consumption of cotton goods shrunk, as generally believed. The problems, it seems to me, are those of distribution, and I believe that the Cotton Textile Institute is going to do a great deal to stabilize that distribution and bring us into a period of prosperity.

"At the present time the population of the United States is increasing at the rate of one million and a half a year. New England is dismantling mills. The South is building very few mills. It seems to me to be a purely economic proposition, and that it cannot go on long without causing a period of prosperity in the textile industry; because the per capita consumption is increasing, on account of automobiles and other trades, and with the total increase due to the population we are obliged to have business, and that business is increasing in proportion to the number of spindles."

Toastmaster Cramer—The next speaker on the program is one whom I approach with a great deal of respect. I have known something of the dyestuff business in this country for forty years, and when I was a young man I was told that the man who is to speak to us next was the leading old man in the business. I don't know that it is necessary to say anything more to you about him. He is better known to you than I could possibly make him by any introduction I might give.

Colonel Herman A. Metz! (Applause.)

The Relations Between Dyestuff Manufacturer and Consumer

By Colonel Herman A. Metz

Mr. Toastmaster and Gentlemen: It is rather an imposition to have me speak to you again, so many of you having heard me before in the North, but, personally, I was glad to be invited to come down. I was glad for an opportunity to renew some old acquaintances and friendships in the South. I have been here many times, but not in recent years. I am glad of the opportunity to see just what you have been doing down here, how you have expanded and grown. It is a revelation, really, to one coming down here for the first time in about ten years.

When I left New York, I didn't know what I was going to speak about. One of the papers asked me what I was going to say. I said I didn't know, that I wouldn't know until I got up on my feet and that I wouldn't know after I sat down what I had said. That is the way it usually is with me. But I see a subject has been assigned to me—"The Relations Between Dyestuff Manufacturer and Consumer."

Well, there is a relationship, I am sure. I am going to tell a little story that my friend Hadley told me this evening. He said his little boy said to his mother one day, "Mom, what is an in-law?"

She said, "In-laws are your father's relations."

The boy then asked, "Well, what is an outlaw?"

Mr. Hadley answered, "They are your mother's relations." (Laughter.)

There is a relationship. Whether it is "in-law" or outlaw, I don't know. But Mr. Green touched on the question better than I have heard it touched on before, and he was right. There should be a close relationship between the dyestuff manufacturer and the dyestuff people.

There didn't used to be much of that here. We took things rather for granted. We had an idea that dyestuffs were a mystery, that their manufacture was something that nobody could touch but a German. We took it for granted that we had to get our dyestuffs from the other side. To-day we know that there is no great mystery about the manufacture of dyestuffs. It is just common sense, chemistry, and application.

Co-operation between the manufacturers and the mills is leading to constant developments because we have learned not only the theory of the thing but the application of the theory, and practical knowledge helps the theory also.

Only a few days ago an old dyer came to me and showed me some results he was getting. He had been buying certain things and I was wondering what he was doing with them. I said, "This is all nonsense. You can't do this."

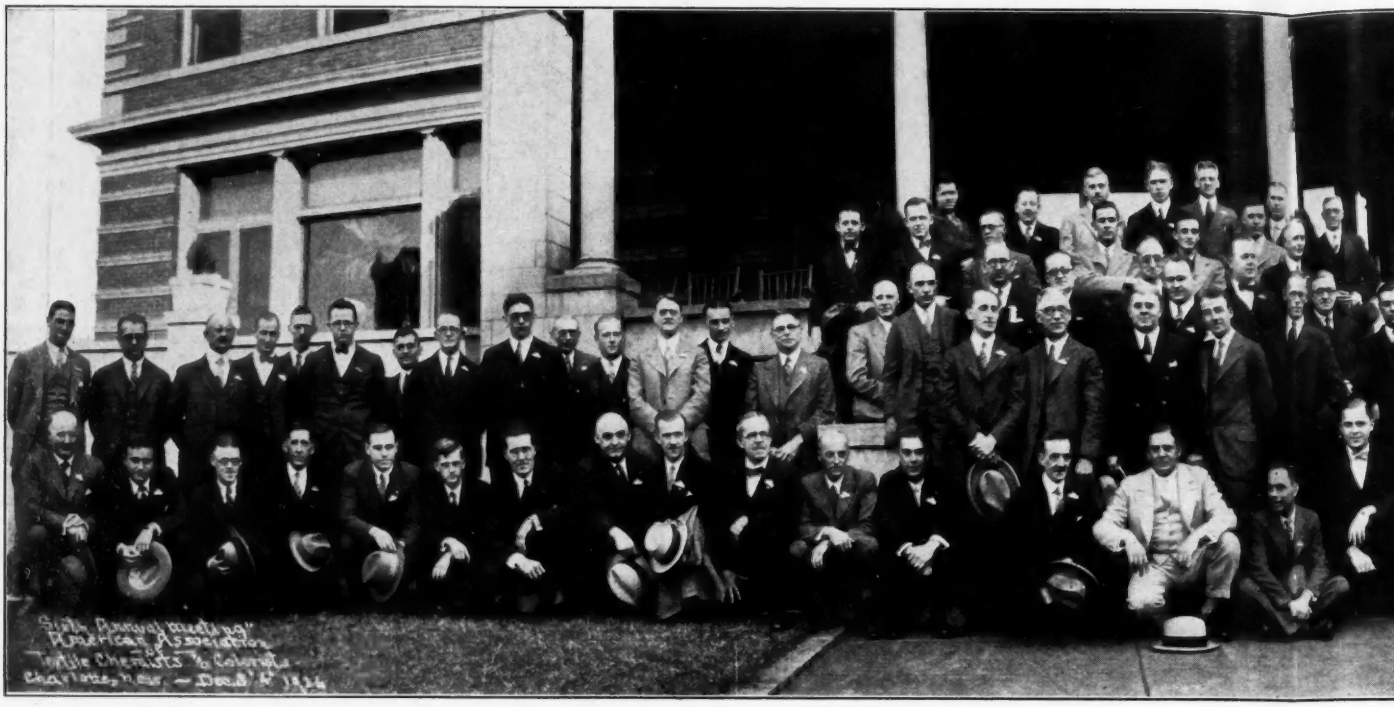
He said, "I am doing it."

I said, "Theoretically, you are simply killing the stuff you are putting in there."

"Well," he said, "maybe I am killing it but it is dying a happy death. Here are the results."

By applying just a little common sense and by means of a little experimenting, he did things that astonished us in the laboratory. We are trying to verify them now and work them out, but in a practical way he got hold of stuff that we, theoretically, would never have thought of.

So it has been right along. The original progress in the dyestuff trade came from the practical dyer. I remember 'way back years ago when we had about a half-dozen colors only and we were using woods. It was the dyer who told us how to dye alizarines. It was the dyer who told us how to make colors fast. And that co-



A Group of Those Attending the Sixth Annual Meeting of the American Association of Textile Chemists and Co

operation brought the dyestuff manufacturer to the point where he really began to do something.

To-day things are reversed somewhat, and as one of the speakers said this afternoon, the simpler the application, the quicker the process, the more attention it takes, and the more care on the part of the dyer. That is true, because you all know that if certain colors which jump on quickly are wrong, they stay wrong, and you can't get them off. You can't change them. They are there, and the goods are spoiled.

Those are practical questions that must be settled through co-operation. We can bring you new things and tell you, "This is easy," "This goes on quick," and this, that and the other thing, but those suggestions have no value unless you work them out practically and see how they work on a large scale.

Dyeing Methods Have Changed

Dyeing has changed enormously in the last ten years. To-day you have machine work practically all over. The old colors that we had years ago don't go to-day. We wouldn't have known that, as dyeing men, without your co-operation. Stuff in the laboratory will look perfectly all right but when you get it, it is all wrong. You do some things we can't do in the laboratory. That means co-operation, and it is high time that we in this country took in the textile chemist. The old rule of thumb way of doing business is gone. The old formulas (and I had a book of those in 1876, and we read them over once in a while) sounded good, but their time is gone.

The more we can get in touch with each other, the more we can get together and talk things over and help each other out, the better off we are going to be, because dyeing to-day is a science and manufacturing is becoming scientific.

You gentlemen say, "The mills are coming down South." That is because the South is progressing.

You are demanding better colors than you did ten years ago. I remember, twenty-five or thirty years ago you used only two or three things down here. Indigo was the big staple. You dyed some Cutch and some Gambier. If you dyed some Benzopurpurin you thought you were doing a whole lot. Those things and blue were the staples down here then. To-day you are dyeing everything. You are coming to fast colors more and more, and you need our co-operation and we need yours to develop those things. It is only a matter of a short time when we are going to have a full industry in this country.

As I say, there was a time when we thought it was mysterious. We thought there was a mystery con-

ists and Colorists, Charlotte, N. C., December 3 and 4. Taken in Front of the Southern Manufacturers Club.

nected with the industry. We have learned a great deal about making dyestuffs, and what we make here is absolutely as good as they make on the other side, color for color, because chemistry is a definite science. There is no getting away from that. We are not making everything, but we are gradually extending our lines. This afternoon you heard some of the things being done here in the way of research that show we are up to scratch and on the minute, and we are going to do more and more of it, with or without co-operation; but we are going to have co-operation.

Research Fellowships

With that in hand, we must go a step farther. We must co-operate, as Mr. Green suggested, with the colleges and with the universities. That was one big thing the Germans had on us for years: their co-operation with the seats of learning. They sent their young men to these colleges and had them educated; they paid for their courses. I was glad to hear Mr. Green say that they are doing the same thing now.

Mr. Clark touched upon the fact that the ladies nowadays don't wear enough clothes to make business good. There may be something to that. But there is another side to that: the less clothes they wear the more goods we sell, because they get colds and we have to sell them pharmaceuticals, and I am in that line. So the ladies needn't put on any more on my account. (Laughter.)

In that branch of the industry we have had the co-operation of the colleges. There have been fellowships established by people in the pharmaceutical line at the School for Tropical Diseases at Harvard and at the Sheffield School at Yale. I personally have established two or three such fellowships, toward the end of improving what we have and doing what they did abroad. We are doing it here now. That co-operation is going to put us in the forefront in chemistry, because the dyestuff business as such has become secondary in the big plants abroad. They have gone beyond that. Their big problems to-day are the fertilizer proposition, making nitrogen from air, synthetic alcohols, and things like that. The high pressure products have taken up their attention. We are just as far advanced as they are, practically, to-day in the dye line, and we can continue to maintain that position and to increase our products and the kind of products we are making, with your co-operation.

The question of fast colors is coming to the front more and more, and the more it comes the more we have to help you and the more we will want your help

in telling us what we need and putting the technical men in touch with you and your chemists. By this co-operation, such as Mr. Green described, we are going to be in the forefront before we get through.

Mr. Clark touched on a point that is pretty close to my heart. He talked about their paying ten cents' fare in Massachusetts. In New York we will take you twenty-five miles on the Interborough Subway for five cents. I am a director of that company. We will carry all the Massachusetts people and all you people from the South all over New York for five cents, and we taxpayers of New York pay the difference. That is perhaps the reason why some people come up there. There are other reasons, I think, too. (Laughter.) But, incidentally, you get two cents' worth every time you ride that we taxpayers in New York pay for.

I was discussing with Mr. Clark some of my old friends that I met in Congress when I was there, and they are going to hear more from this chemical industry. They have heard enough in the last few years, but they are going to hear more. I am going to Washington on Monday for a conference that the Hoover committee has arranged.

Industry Must Be Self-Dependent

We want to do all we can to further the industry in this country. I know some of you are going to smile when I say that, because we differed somewhat in the past; but I want to say right now, we never differed on the results to be obtained; we differed only on the method of obtaining them.

I have always said, and shall continue to say, that we must be independent in every line of industry in this country. We must be self-dependent in every industry, because we are too big to have to depend on any foreign nation, and the sooner we get to the point where we are self-dependent in all industries the better off we will be. I don't care how we get to that point, so long as we become self-contained in our industry. We can supply the world to-day with lots of things, and there is no reason why we shouldn't be able to at least supply our own market with everything; and I must reiterate that the way to accomplish that result is through co-operation, through working together, helping each other, and not being afraid to talk to each other. A few years ago, if two dye men saw each other on the street they would walk up different sides of the street. To-day we can sit down together at any time and help each other, and if we will do that we will win out.

As I said when I started to talk, I am glad to have had the opportunity to come down here and say these few words to you. Thank you. (Applause.)

Toastmaster Cramer—My friends, I was very much interested to hear about being carried around New York for two cents. That is the first time I have ever been moved around New York for two cents in any manner, fashion or form, and I think you will all agree with me. (Laughter.)

As for New York's prosperity, I have always flattered myself that it came from what our English friends call "the provinces," the South and the West. Our money goes into New York like a great inverted river, you might say. So I rather think that the director of the subway and elevated systems and all these other methods of transportation is perhaps better off by getting us there and giving us these cheap two-cent rides so that we will come away feeling that we have gotten our money's worth on something. (Laughter.)

I have here a telegram that I know you will be interested to have me read. It is from your President and is addressed to Dr. Killheffer:

"Many regrets not to be enjoying the hospitality of the Southern Section. Hope for better luck next time. Am sure the program is progressing under the efficient leadership of our Vice-President and Secretary, and with the hearty co-operation of the local committee. Await with much interest reports of the meeting."

I have been very much interested in talking to a gentleman here to-night whom I hadn't had the pleasure of meeting before, and who, I have just learned, is not only the Vice-President of your organization but also the vice-president of a great chemical works. I needn't introduce him, I am sure, for I should feel ridiculous if I tried to.

Gentlemen, your Vice-President, Dr. Killheffer. (Applause.)

Address by Vice-President

Dr. Elvin H. Killheffer—I am just going to try, very briefly, to leave with you the message that Professor Olney would have left, had he been here.

I am sure it has been most encouraging to all of us to listen to the remarks of the several preceding speakers, particularly as they referred to co-operative effort, and the remarks particularly of our toastmaster when he extended what I hope was a promise, that in the Textile Institute they hope and expect to include us at some point in their work, because, really, that is the biggest problem, I think, facing this Association to-day: the problem as to how to put its research work on a sound basis, so that it can go forward systematically and with regularity. That means a solid financial foundation.

As you know, we have had a research fund now for several years, made up chiefly of the proceeds of corporate memberships and the individual contributions of some of the members. These have not been in the form of annual pledges but have been entirely voluntary. It is obvious to you that a fund built up in that way hasn't very much stability. Nor has it very great magnitude. What we really need to do, as an Association, is to evolve some plan whereby we can offer enough in the way of services, if you please, to other interested associations, such as the Textile Institute which has been mentioned, and other similar associations in the country, so that they will feel it well worth their while to contribute financially and systematically to the real research or investigational work of this Association. When I speak of research work, I mean, of course, co-operative research or research of co-operative value.

Research Plan Needed

We have carried on, I think, a work that we are all justly proud of, which has been brought out quite clearly in some of the reports of the subcommittees to-day. The remarkable thing is that that work has progressed as far as it has with the means at our command. That has only been possible, as you were told at the meetings to-day, by the co-operative effort of many laboratories scattered in different parts of the country.

How much better some of that work would have been had we had at least one, and preferably more, workers at some central location (the Lowell Textile School, for instance, if you please) under the direction of someone like Professor Olney, himself, who is the Chairman of the Research Committee! I, personally, would very much like to see some such plan worked out and brought to a successful fruition. That, I know, is basically a thought that has been with Professor Olney for several years, and it is one in which I, personally, am deeply interested also. It is one that deserves your serious thought and consideration as to how best we can evolve such a plan, so that the work may go forward.

There are several points that the Professor wished to mention and I shall just refer to them briefly.

The first thing he wanted to mention was the desirability of chairmen and program committees of local sections making efforts to secure a greater number of speakers and papers from among their own membership. His thought in this connection is that this will do much to develop many latent possibilities among our own members and every case of such co-operation means an added interest in the Association and its assured development.

In each section there are many members capable of giving extremely valuable and interesting papers. It may require some effort and persuasion to convince them. It is often the case that a man who has refused to present a paper will during the discussion of someone else's paper give a vast among of interesting information which with a little preliminary thought and preparation could have been developed into an interesting and original paper.

Those are the Professor's own words in that connection.

Membership Qualifications

Our President also wanted to take this occasion to classify somewhat in the minds of the members the attitude of the Council toward applications for membership. He points out that "the Constitution of the Association states quite specifically the qualifications for active membership. The Council has always been as considerate and as liberal as possible in its interpretation of the Constitution. Whenever there has been any doubt whatever as to the qualifications of an applicant further information has always been secured from the applicant, himself, or from those who have indorsed his application.

"From five years' observation, I am quite certain that most of the difficulty which the Council has experienced and the misunderstanding which has arisen in regard to its decisions has been due to several specific things: First, the indorsing of application blanks by members who should have known that they were lending false hope to the applicant; second, incomplete and inaccurate data on the part of the applicant; third, the endeavor to camouflage under the head of 'demonstrating salesmen' the fact that the applicant was a straight salesman or executive whose qualifications and experience would by no means come up to even the most liberal interpretation of the Council.

"In order that there may be no misunderstanding in regard to one point, let it be said that the dyestuff executive or salesman with a long and successful record of experience along the lines of dyestuff application is welcome as a valuable member of the Association, but that in accordance with the Constitution the salesman or executive without such experience has no standing whatever as an applicant and should not be encouraged to believe he has by over-enthusiastic members."

The balance of what our President has to say relates entirely to the subject that I have already mentioned, that is, the support of the Research Committee and the research work of the Association.

I am very hopeful, indeed, that we will all of us carry this thought with us very seriously and try to interest those who may be interested in this co-operative and intensive research program of the Association.

Thank you. (Applause.)

Toastmaster Cramer—Gentlemen, I purposely refrain from commenting on anything that your Vice-President has said, for very obvious reasons. I should like to add

just one word, however, and that is that the Cotton Textile Institute is very serious in its intention of establishing a contact with every organization, every agency, that can contribute toward the success of the cotton industry, and I repeat that I think the work you gentlemen are doing constantly and daily, concentrated and put into form in some of your publications, and through some of your committees, is going to be of immense value to us

You are really, as I understand it, more or less of a professional body, as well as a lot of practical men. It is a pleasure to speak to men of that type. I have had a little bit of experience of that sort, myself. But we have with us to-night another man, of international reputation as an engineer, who has done an immense amount of work and contributed immensely toward the development of the Southern cotton textile industry.

If I may ask your indulgence for a few minutes, I should like to say that our next speaker is a Southerner by birth and that a number of years ago he was engaged to put in a small power plant of twelve thousand horsepower (I think it was that) hydroelectric power by Dr. Wiley. Dr. Wiley happened to be the physician for J. B. Duke, who became interested in this man in that way. If you could have seen what that little outfit of twelve thousand horse-power was and how it compares with the nearly million horse-power in hydroelectric and steam electric power that has been hooked up with one grand bus-bar to-day all through the South by this engineer, then you would, I feel sure, stand up when you greet him. Those of us in the South in particular appreciate his work, but it has gone beyond the confines of the South, and his Canadian work is perhaps even bigger than his Southern work.

I should like to talk on this subject for quite a while, but this gentlemen, who is a friend of mine, is going to talk for himself. He talks well and he recites poetry well (I don't know whether he will do so to-night; I think he is afraid of Dr. Daniels, so he probably won't, but we will give him a chance, at any rate).

I have the pleasure of presenting Mr. W. S. Lee. (The audience arose and applauded.)

Power in the South

By W. S. Lee

Mr. Toastmaster, Mr. Chairman of the Southern Section, Mr. Vice-President, Members of the Association, and Guests: I am somewhat of a cornfield engineer myself and I take a great deal of pride in meeting and studying your various problems that engineers of the different branches are undertaking to solve.

I must admit that I have been somewhat confused to-night, sitting next to your Chairman. The last time we had much to do with one another we were pretty badly beaten in a golf game. (Laughter.) I asked him if this was the American Association of Chemists and Colorists and, frankly, he couldn't tell me. He didn't seem to know whether it was chemists and colorists or colored chemists. (Laughter.) All I have to say is that if it is colored chemists, you have done the finest chemistry job in bleaching the crowd that I ever saw in my life. (Laughter.)

Gentlemen, your Committee and my good friend have asked me to say something to you for a few minutes about the relation of central power to industry.

We all know, but doubtless few of us have thought about it, the part that power (and when I refer to "power" in this discussion I am referring to mechanical power) has played in the history of the world and the development of the wants and needs of man.

If we go back to the very beginning of time, we find that man sought food, raiment, and shelter. If we go back and take the census of the horse-power or the man-power of the world, we find that we began with one man, one man-power. No sooner had he taken charge of the earth than his necessities began to multiply and he was called upon to multiply his mechanical power. He harnessed his old ox and horse—and that is where we get the word "horse-power." One horse-power we found equivalent to about six or eight mechanical men. And man's ability to serve mankind and ameliorate the sufferings of humanity was largely due to the amount of power or mechanical help that he got to assist him in providing the things that man needed, that is, to provide food, raiment, and shelter.

I could talk to you a good deal along this line, taking it up from the beginning, when he harnessed the ox to the horse, and bring you up to the modern power plant in which we are all interested more or less to-day—electric transmission and the handling of power for your various industries and the various uses of man. I am not going to do that, however. It will be sufficient for me to say that this has culminated in the modern use of electricity which is so easily applied and can be applied in minute portions or in large portions as your work, or as my work, as engineers, as captains of industries, or as mankind needs in its various phases.

The Growth of Horse-power

With that little prelude to it, I want to tell you something about what has electrified the South in this immediate section. I have told you that one horse-power is equivalent to about eight mechanical men. Therefore, for every horse-power that we have put into operation in this section, or in any other, we have produced eight men working, striving to solve these problems and to

ameliorate the suffering of and to work for the benefit of mankind.

It takes but a rudimentary knowledge of mathematics for you to figure that if we have placed a million horsepower at work in the South, which the power companies have in the way of central power, we have immediately put into use eight million men that are helping to build this country, and that is why you are here, and that is why I am here: we are looking over what has been done there.

So when you apply mathematics to the mechanical side of it you can readily see it would be impossible to loosen that energy in any particular section without making this enormous industrialism that you have seen perhaps in your trips around here.

Let us see what kind of men we have produced. It is true they are mechanical men. It is true they haven't the brains to think out the new problems that you and your associates have, but they are working there, and working without any effort to go on strike, without asking the community to provide homes for the unfortunate. They are ceaseless, tireless workers, working continuously, and, as Kipling says:

"They can work for an age at a sitting and never grow tired at all."

That, I say to you, is something that has given us this prodigious, enormous impetus in our industrialism in the South, especially in the Piedmont Section of the Carolinas.

With your permission, as a good many of you are strangers to us here, I want to tell you something about how this transmission or central system operates. It happens to be my good fortune to have grown up with the system here, which is one of the large systems of the world. It happens to be my good fortune also to be the oldest employee in that system. In fact, gentlemen, I own the whole company, except the stock. (Laughter.)

I have seen this development that your toastmaster referred to grow from a few thousand horse-power until now we are bordering, with the work now under way, close to a million horse-power.

Linked Power Systems

That is not the only company of its kind operating in the South. We connect with another system on the east. We connect with one on the west. It is possible to-day to transmit power one thousand miles across the South, power operated by different companies, and I say to you that that can be done to-night by the dispatcher at the board without referring the matter to a single executive. If the city of Atlanta should blow up its station to-night, we here in Charlotte would pick that load up on our lines immediately, and we have no stock interest or anything of the kind in the Atlanta station. We are simply working on a neighborly, working plan such as you people are advocating among all your branches of the industry.

We did not reach that point, gentlemen, in a day. When I began here a few years ago there were various reports being sent out by the Government about interlocking directors and power companies being tied together. Yet when the war came they called us all together and said, "Tie them all together." We tied together and we have never come loose, and furthermore, we will never get loose. We are going to continue to serve the public and to give better service to everybody, and the public is not interested in whether you have interlocking directors if you give them the right kind of service at the right price and in the right form.

Before I go on to some others, I might refer to our own Government. Many of you recall that the United States Government undertook to pick up the superpower plan. Perhaps many of you have read it. They employed eminent engineers, some of whom I know very well, and who I know are able men. The United States Government appropriated one hundred and twenty-five thousand dollars to make this report. The public interests gave twenty-six or thirty-six (I am not sure which now) and they made a plan for superpower, whereby they proposed to hook up all the power plants and steam plants from Boston, Massachusetts, to Washington, D. C. While they were making their report, I want to tell you gentlemen we built the system in the South, and it is operating to-day. If you were to place the map down on it, the power would hang out of it at both ends. That is what has been accomplished in these three States adjoining here. One company owns the system and it is operating at this moment, supplying the very energy that you are getting in this hotel.

Power in the Textile Industry

You want to know what relation this has to industry. Gentlemen, North Carolina (and I am a South Carolinian, too; I want you to know that) is making the greatest progress in her textile and industrial expansion of any State, I believe, in the Union. We are growing in North Carolina big men from little men and we are doing it because we have an elastic, bookcase system of power. When they build a small mill here, they can add on to it as they feel they are in position to finance, operate, and build a larger mill. The result is that there are more executives being grown in the State of North Carolina in this industry than in any other state that engages in the business.

A short time ago, you remember, the textile industry was led by Massachusetts. Next came South Carolina, then Connecticut, Georgia, and then North Carolina.

That was only three or four years ago. Statistics show us to-day that the rating of the States in regard to spindles to-day is as follows: Massachusetts, North Carolina, South Carolina. If we dig further into statistics we will find that North Carolina has more operating spindles than Massachusetts, notwithstanding that Massachusetts has the greatest number. After all, they are built for operation.

That is true not only of the textile industry but of the smaller industries that are following in the wake of this development. We have the electro-chemical industry coming on in a way. We have the metallurgical industry coming along. We have an effort more or less in some of your own branches. I say, however, they are small compared with the total amount. . . .

If you want to get an idea of how far it is across this particular system that I am describing as a Southern system, you must bear in mind that your fastest express train running across here runs eight to ten hours under the shade of this line before it passes out.

We are delighted to have had you gentlemen here. We know you are interested in us. We are interested in you. We believe that this is not only a good place to build manufactories but we believe we have a good bunch of people down here and that it is a good place to live. We want you to come here again. . . .

I thank you. (Applause.)

Toastmaster Cramer—Comment on that speech is unnecessary, except that my prophetic soul worked when I predicted poetry. (Laughter.)

I don't know who arranged this program, but if I had arranged it myself I couldn't have beaten it. When we in the South have guests from other parts of the country, or when we have guests among ourselves, there is just one man we all want to hear. I should like to tell you who he is. I don't know whether he is the president of Clemson College or whether he is a professor there. Perhaps he is the chaplain. At any rate, his vein of humor and his serious philosophy are so beautifully mixed that I never hear him without a great deal of enjoyment and profit.

I should like to introduce to you Dr. Daniel of Clemson College, and the South. (Applause.)

. . . Dr. D. W. Daniel addressed the audience on the subject of "The Relation of the Technical School to the Textile Industry." His address was a most delightful combination of interest and humor. . . . (Applause.)

Toastmaster Cramer—Gentlemen, good night!

Applications for Membership

Active Membership

Steen, Lambert, colorist, Craemer & King Company, Paterson, N. J. Sponsors: S. F. Carter and Dr. Alfred Pfister.

Junior Membership

Kane, Henry F., laboratory assistant, Pacific Mills, Lawrence, Mass. Sponsors: G. A. Moran and William H. Cady.

GOVERNMENT BUREAU SHOWS LARGE PROFITS ON YEAR'S ACTIVITIES

The "investment" by the American taxpayer in the foreign trade promotion work of the Department of Commerce, involving an annual appropriation of about three million dollars, was returned more than sixty-fold during the fiscal year 1925-26 by one single item alone on its list of activities, namely, the new foreign business secured for individual American exporters as a direct result of the assistance of the Bureau of Foreign and Domestic Commerce.

This approximated $189,376,000 according to figures contained in the annual report of Dr. Julius Klein, director. And this item, it was pointed out, was but a part of the dollars-and-cents record of the organization, at least an equal share being the savings effected by its "clients" through their elimination of wasteful or unnecessary efforts in domestic as well as foreign business based upon information supplied by the Bureau.

That the attention of a growing number of manufacturers is being directed toward more accurate and considered trade strategy—both abroad and at home—is indicated by the fact that 2,032,000 trade information services were rendered to firms and individuals by the Bureau during this fiscal year as compared with 505,000 services rendered in 1922.

Striking evidence, not only of the practical values contributed by the service, but also of the fine collaboration extended to its work by organized industry throughout the country, is shown by the operations of some seventy advisory trade committees, each acting as counselor for the Bureau in behalf of its respective industry. Through these contacts the personnel of the Bureau is maintained on a thoroughly efficient expert basis.

Varied phases of trade promotive activity by the Bureau's foreign representatives, reported by Klein, include the securing of effective foreign representation of American goods, aid in connction with large contracts, governmental loans, adjustments of trade disputes and difficulties, protection of American trade-marks and copyrights, securing equitable treatment for American goods under local regulative measures, and many others.

Foreign Sales Prospects Good

The retrospect and prospect for increased sales of American goods in the markets of the world are altogether encouraging, according to Klein. Until recently, it has been impossible to judge whether the increased volume of our export trade was merely accidental and temporary or whether it reflected a general trend which might be expected to continue. It is now clear, according to Klein, that the growth of our export trade from the low point of post-war depression in 1921-22 has been of a normal character and due to causes which bid fair to continue.

Many concrete results were also attained by the domestic branch offices of the Bureau throughout the United States, which rendered during the year a total of 1,708,808 trade promotive or informational services.

A conspicuous feature of the Bureau's work has been its greatly increased activity in the field of domestic commerce during the year which enables it now to serve the small local retailer just as well as the great export organization. This phase of the work has launched a series of regional analyses of distribution in different parts of the country in order to discover possibilities of eliminating wasteful marketing methods.

American business has long been intimately familiar with the exports and imports of its leading foreign markets and competitors, but it now requires increasingly accurate and impartial analyses of the commercial movements and possibilities of the major trade areas of its greatest market, the United States.

TEXTILE GROUPS ARGUE FASTNESS STANDARDS

The fastness guarantee is on trial for its life. Men and women representing various groups and associations of textile manufacturers and consumers met at the Hotel Pennsylvania last Thursday, December 9, and made a vigorous effort to clear away the fog surrounding the question of how to stop misbranding of goods as to their fastness. This meeting was called by the Joint Committee of the Textile Industry on Misbranding.

A warm discussion of fabric fastness and guarantees was started by the report submitted by Prof. L. A. Olney, President of the American Association of Textile Chemists and Colorists, and W. D. Appel of the Bureau of Standards. This report, which was read before the meeting by Mr. Appel, outlined definite fastness standards for light and washing for cotton goods and gave definite tests on which those standards are based.

George Fogarty, of the Converters' Association, acted as chairman of the meeting. M. J. Warner, president of the same association, praised the fastness standards report as the first important step toward a solution of the problem, and vigorously answered all questions of those who objected to certain details of the plan he sketched for settling troublesome disputes arising from fastness claims. Those attending the meeting passed a resolution to refer to their respective associations the report on the standards and tests and to discuss the whole matter further at another meeting. A similar report giving fastness standards and tests for silk and wool, it was also decided, should be prepared and submitted to the committee for approval.

The vital problem of satisfying the consumer on the moot point of just how fast a particular fabric is was discussed at length by those present, from the viewpoints of the textile manufacturer, the dyer, the converter, the retail drygoods merchant, the laundry owner and the housewife. Edward L. Greene, managing director of the National Better Business Bureau, and Malcolm Flannery, of the Federal Trade Commission, rose to express the opinion that what had been done by the committee

in accepting these standards was sane, fundamental and important.

The standards report submitted by Professor Olney and Mr. Appel classes fabrics as: a. The best of the "fast" colors, i. e., those which will stand unusual treatment; b. Good colors, those which will stand ordinary light exposure in the one case or reasonable laundry treatment in the other; and c, Commercial colors of no particular fastness. Washing and fading tests are given to determine such classification. The report will be published in full in the next issue together with a more complete story of the discussion that it started.

I. G. ACQUIRES 50 PER CENT INTEREST IN LEADING FIRM OF SPANISH DYESTUFFS INDUSTRY

The Fabricacion Nacional de Colorantes y Explosivos, S. A., Barcelona, Spain, has been authorized by royal decree of the Presidency of the Council of Ministers, dated September 19, 1926, to reduce from 75 to 50 per cent the capital of the company which must be Spanish owned in order to secure the benefits accorded to national industries under the Royal Decree of April 30, 1924. This company has a nominal capital of 7,000,000 pesetas, represented by 14,000 shares of 500 pesetas each, and a bonded debt of 2,000,000 pesetas, bearing 6 per cent interest, and was formed by the fusion in September, 1922, of four of the principal Spanish manufacturers of colors. Very considerable interest attaches to this decree in that it practically turns over the Spanish dye industry to foreign control, inasmuch as the company has occupied a unique position due to special legislation in its favor.

The "Gaceta de Madrid," of September 26, 1926, publishes the exposition preceding and the text of the decree as follows:

"The Sociedad Anonima Fabricacion Nacional de Colorantes y Explosivos proposes to amplify and perfect its productive capacity, importing elements and methods of the most advanced technique, for which reason it requests that it be relieved of the complete fulfillment of one of the conditions that the Royal Decree of February 30, 1924, imposes in order that the industry may be considered entitled to protection, i. e., that at least 75 per cent of the capital should belong to Spaniards. Should this exception not be conceded the operation in view could not be realized as the foreign group will bring with it the necessary technical methods and elements, and requires a participation of 50 per cent of the capital and further, the society is not in a position to lay aside its status as an industry entitled to protection which it has solicited and the determination of which is pending governmental resolution.

"The Government believes that the importation into Spain of chemical procedures which, by using raw materials available in a country, lead to the ideal of a self-sufficient nation, is of highest interest from the point of view of national defense. On the other hand, the Government believes that dealing with an exceptional case, it is preferable to dictating a special disposition and not to modify in a general manner the royal decree of aids to national industries by altering the system of guaranty adopted."

The text of the Royal Decree reads as follows:

"The Fabricacion Nacional de Colorantes y Explosivos, S. A., is authorized as an exception to the provisions in Article, 1, base 2, section b, of the Royal Decree of April 30, 1924, to reduce to 50 per cent the portion of its capital, which, according to said Section b, must be in the hands of Spaniards, without the loss of the condition of a national industry entitled to protection, with the condition in case it should request any of the benefits authorized by the mentioned Royal Decree that it should be subject to the other conditions of the mentioned Royal Decree and the regulations for its execution."

It is understood that German interests will supply the technical elements above referred to and that 50 per cent of the capital of the company will pass to their hands.

It is to be noted that the Spanish dye industry has not up to the present attained large proportions and has been in a position to supply only an insignificant share of the needs of the Spanish market. This industry has not only been protected by the Spanish customs tariff, the present prevailing rates on aniline colors being for the most part from 1.50 to 4 pesetas per kilo, net weight, according to items 793-796 of the Spanish customs tariff, but there have also been decrees during the present year prohibiting, except under license, the importation of certain colors which the national industry is in a position to furnish.

GERMANY'S EXPORTS OF COAL-TAR PRODUCTS INTO THE UNITED STATES

Germany's exports of coal tar products into the United States for the year 1925 showed an increase in quantities of aniline dyes, colors, etc., to 2,185,411 pounds, valued at $2,487,517.12, from 1,582,971 pounds, valued at $1,947,260.75. Imports of indigo and indigoid rose from 76,965 pounds, valued at $52,938, to 179,306 pounds, worth $121,203 in 1925, while miscellaneous coal-tar products reached a height of 3,204,530 pounds ($393,096.30) from 374,188 pounds ($125,741.10). However, exports of creosote oil to the United States fell in 1925 to 3,010,600 gallons ($409,362) from 6,768,208 gallons ($1,343,849) in 1924. (Consul General W. Coffin, Berlin.)

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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WHERE RAYON DYEING TROUBLES START

A GERMAN chemist claims to have invented a process for making an artificial silk from crab and lobster shells. If this can be worked on a commercial scale it will give man one more source of textile raw material.

Every new synthetic fiber, chemically different from all other known fibers, offers a new problem for the dyer and textile chemist. Rayon comes first to mind, of course, as the most recent and striking illustration of how a new kind of textile will start a long series of studies on the manufacture, weaving and knitting of the fiber and its dyeing, finishing and washing for practical use.

Most of the important questions about rayon have now been answered by independent investigations and by studies in the research laboratories of rayon manufacturers. As various solutions to its dyeing problems are found they are passed on from the scientist's laboratory to the mills that buy rayon. But at this point the trouble starts. The mill management naturally has not paid much attention to the abstruse technical discussions about the dyeing properties of the new fiber. They have passed the information to their dyers. It is not their business to know the dyeing differences between one kind of rayon and another. So some particular brand is ordered on its advertised merits, the term "merits" in this case usually meaning nothing more than luster, "feel" and general appearance as a good weavable or knittable fiber.

That is the first step toward trouble: buying rayon without carefully considering its *dyeing* properties, just as though it were cotton or silk. Various kinds, made by different manufacturers, frequently even sold as one lot, are used together without discrimination. But nothing very serious happens until the fabric reaches the dyehouse. The dyer, of course, is a mind reader; he must guess what particular kinds of rayon he is about to process. Then he very gingerly experiments with the first batch and, more often than not, fails completely to produce the desired effects.

That is the second step toward rayon dyeing troubles: buying rayon without first consulting the dyer and chemist concerning the best kind for the mill's special purpose. The dyer is expected to work in the dark. Instead of dyeing, he must experiment, which costs money and causes complaints. And he is blamed whenever a lot is spoiled in processing—all because the rayon was ordered without any consideration of its dyeing properties when used alone or in combination with other brands or with cotton, wool and silk.

Rayon will be synonymous with dyeing troubles until mills change this practice of buying it as though it were all the same, no matter what the brand name may be. Rayon manufacturers can help and in fact are helping to bring about this change in buying methods, to protect the reputation of their own products. The mill purchasing department can also help by appointing the mill laboratory to test every sample for its dyeing possibilities before a lot is ordered. But more than either, the dyer can help by persistently complaining to the management until they understand that he is actually working for *their* interest in trying to avoid costly experimenting with one kind of rayon and another.

Dyers who have trouble with rayon certainly cannot expect to remove that trouble unless they bring some strong pressure to bear at the point where it starts—at the point where the rayon is bought. The dyer himself is at fault if he does not insist upon the laboratory's O. K. on every rayon order.

GERMANY'S LOST DYESTUFF TRADE

GERMANY still produces more dyes than any other country, but, as is well known, she no longer controls the world's dyestuff trade. The tremendous loss of foreign trade sustained by the German industry when it was tilted from its eminence during the war has never been fully estimated. We can only compare figures on the industry's production and exports of dyes for a pre-war year with those for last year, recently published, and from this comparison form some idea of how sharply its trade has declined.

Before 1914, it is generally admitted, Germany controlled 88 per cent of the world's supply of dyestuffs. It is almost unnecessary to explain that other countries making dyes at that time merely assembled German crudes and intermediates and so were dependent for their output upon this foreign source. German dyes now, however, form less than 20 per cent of the estimated productive capacity of the world's dye industries. Few national industries have suffered such a marked slump in trade as this.

Germany is still the largest *exporter* of dyes; the United States is second. But the foreign trade of Germany to-day in coal-tar products cuts a very small figure beside her exports of 1913. In the pre-war year ap-

proximately 239,000,000 pounds of German dyestuffs were shipped out to the consuming markets of the world; they were valued at more than $51,500,000, a sum over seven times the value of our dye exports of last year. To the United States, in 1913, came 52,900,000 pounds, or 19 per cent of this huge total. Then came the war and the bottom dropped out of Germany's dye trade with a loss never to be completely retrieved. Last year, 1925, Germany sold to other countries only 75,800,000 pounds of her colors, a drop of nearly 70 per cent from her 1913 exports. Moreover, last year the United States bought only 2,600,000 pounds, roundly speaking, of German dyes, or almost fifty million pounds less than in the pre-war year.

In spite of this great decline in Germany's dyestuff trade, her exports of coal-tar colors are rapidly increasing. Last year they went up 24 per cent in quantity and 43 per cent in value over the 1924 exports. It is clear that the German industry is fast regaining many of its foreign dye markets and has already become the strongest competitor in this field, even though the world is no longer solely dependent on German dyes.

WORTH STUDYING

HE is a rare business man who studies the trade and statistical information on his own industry. It is sometimes said of a man that he has all the data about his work "at his finger-tips"; but frequently it is so close to him that he overlooks it, or becomes so accustomed to seeing it on his desk day after day that it no longer has any value in his eyes. And, ironically enough, he will in some emergency go far afield in search of that very information and hound his secretary into insomnia until it is found.

One important source of information whose existence is too often forgotten by the dyestuff industry is the Government's annual Census of Dyes. For its painstaking work in preparing this excellent book the Tariff Commission is warmly praised every year by the Synthetic Organic Chemical Manufacturers' Association. But still the value of the census is not recognized—certainly not appreciated—by all those in the industry who could make profitable use of its contents. It is accepted, on the whole, too casually. Too many business men, especially those who measure business conditions by their own profit and loss sheets, have an unjust contempt for statistics.

The statistics in the Dye Census on the production, exports and imports of crudes, intermediates and finished products, the new figures on the cost of dyes in various fabrics and the very complete survey of foreign dye industries—these and other features of the census deserve thorough study by all dyestuff men who would keep informed on what their industry has accomplished and what trends it may be expected to take in the future.

THE WORKER'S HEALTH AND PROSPERITY

By Helena Lorenz Williams

There is no better provision for a long life and a prosperous one than disease prevention by means of good working and living conditions, nourishing food, and healthful rest and diversion. The modern sunshine factory building is good for the worker as well as for the employer, for it promotes efficiency and thus higher wages. In a book entitled "Health and the Workman," Dr. Lee K. Frankel, vice-president of the Metropolitan Life Insurance Company, and chairman of the National Health Council, states that among the important factors that preserve and increase the health and efficiency of the worker are good lighting, careful ventilation, protection against dust and poisons, adequate washing and toilet facilities, and a plentiful supply of pure, cool drinking water.

The best lighting is daylight, but whether day or artificial light is used in the shop, there ought to be no glare. This can often be prevented by covering the electric bulbs with a shade so that the light beams cannot fall directly into the eyes. The shop should always be well aired, and the temperature kept around 68 degrees, if possible, by opening the windows occasionally, and keeping the air in constant motion.

Paper towels, that are used once and then thrown away, are both inexpensive and safe. The well-equipped shop, of course, has both hot and cold water, so that the worker can scrub his hands thoroughly several times a day. Unfortunately, however, in many plants where these facilities are provided, the workmen do not use them as they should. Private dressing and locker rooms and adequate and properly located toilet facilities for both sexes also help to prevent the spread of disease. Working clothes that can be taken off before meals and at the end of the day keep dust and dirt from getting on food and being carried home to the children and family.

Food and Sleep

Last year approximately 50,000 workers died in the United States of tuberculosis. A large percentage of these deaths might have been prevented by more healthful living and working conditions. The inhalation of dust, for example, still remains a source of danger to quarry, textile and many other workers. Lead poisoning is feared by painters, potters, glass workers, plumbers and others who must work with lead. Yet both dust and poisons can be guarded against. There are devices on the market that are so well constructed that they reduce these hazards to a minimum. Here again, however, the worker himself is too often neglectful. He is too sure that *he* will not "get it." Also, he disregards personal cleanliness, which is such an important factor in reducing the possibility of swallowing germs as well as dust and mineral particles.

Another essential to good health and physical resistance to sickness is good food. The amount and kind of food

the worker should eat depends somewhat upon the type of work he does. But if his meals include plenty of green vegetables and milk, and meat not more than once a day, he is not apt to go far wrong. The important thing to remember in the matter of food is that every meal should be well balanced; that is, starchy foods such as rice, potatoes and spaghetti, for example, ought not to appear too often on the table at the same time. One of these, together with meat and such vegetables as spinach, kale, string beans, asparagus and beets, and fruits and salads, makes a food combination that is needed to make the body a well-stoked and energetic machine. Variety of food is an absolute necessity.

Finally, the worker needs eight hours of refreshing sleep, and several hours each day for recreation or diversion that is totally different from his job. For example, the man whose job requires the constant use of his muscles needs to rest physically after working hours; but the man who sits still all day will be healthier if he digs in the garden, or walks, or takes some other outdoor exercise during his off hours.

The national, state and local turebculosis associations in their campaign against tuberculosis, advocate a strong body as the best preventative against disease. Their nineteenth annual sale of Christmas seals, which finances their educational and relief work, will be held throughout the country in December. You are invited to share in this great life-saving campaign by buying Christmas seals.

GAS PROTECTS WOOL GOODS FROM MOTHS

The Department of War has just announced that it has solved, for the present at least, the moth problem in its woolen goods storehouses. By the use of a combination of sodium cyanide and sodium chlorate gases, the Army has disposed not only of moths, but has rendered the larvae incapable of incubation.

The full text of the announcement is as follows:

The results of recent successful experiments conducted by the Quartermaster Corps and the Chemical Warfare Service of the Army may be of interest to manufacturers and proprietors of warehouses.

At the Quartermaster Intermediate Depot at Jeffersonville, Ind., there is maintained a stock of cloth, felt, saddles, sheep skins, blankets and other articles of Army equipment. In spite of all precautions, these supplies have been subject to the ravages of moths.

With the assistance of the Chemical Warfare Service, the warehouses and their contents were treated with a gas of sodium cyanide and sodium chlorate. Not only were both moths and larvae destroyed, but all rodents came to a similar fate. To make the test complete, an attempt was made, without success, to incubate some of the larvae.

This gas does not injure textiles, fabric, leather, woodwork or household utensils. It tarnishes brass and nickel, but does not have any effect on silver.

The Dyer's School of Experience

[EDITOR'S NOTE.—*The following narrative is one of a series being published under the general head of "The Dyer's School of Experience." Realizing that the genuine material for such a series is to be found largely among its own readers, The* REPORTER *solicits contributions from that source and will pay for those accepted at regular space rates. Among the readers of this journal there should be many who have, in the course of their experience as dyers or chemists, encountered incidents which should prove most interesting and helpful to their fellows. Send all manuscripts to* AMERICAN DYESTUFF REPORTER, *90 William Street, New York City.*]

EARLY "LAB" TROUBLES

By HANG DO

IF this first contribution to The REPORTER should prove acceptable there may be more by "Hang Do," which is more or less a composite name for the authors, who have been at the dye game together for seven years. That's not long compared to Noel D. White's association with the dyehouse, but it has been fairly replete with problems and some of their solutions.

Not quite seven years ago we two, the silent author a graduate chemist, and the writer with some chemical training in a university, started out in a dyehouse. "Hang" was the dyer replacing an elderly German dyer who wished to retire. "Do," the writer, was in charge of the laboratory and other departments using chemicals, such as the water department and the wool scouring department.

Our first laboratory was a very small one in the northwest corner of the wash room. We had a good balance, some dye pots, an air bath on a gas plate and some sample dyes. Almost immediately the writer started to test dyes then in use against the samples of other manufacturers. It wasn't long before we found less expensive dyes with the same qualities as those in stock. On some we saved as much as a dollar a pound. Some years ago prices were beginning to drop and they dropped so fast we changed dyes often in order to take advantage of the prices so constantly changing.

UNION SHADE PROBLEMS

To begin with, the new dyer had only a few shades on hosiery, union, straight cotton, or wool and some raw stock. As he had had some chance to observe the old dyer at work he wasn't exactly green to start with. However, he did learn that Cyanine Blues cannot be boiled without turning red, but soon found a

standard remedy for that, namely, a quarter of one per cent of chrome and an easy boil. Even in those days of standard shades which were few and dark we had trouble getting a union-cordovan on wool and cotton hosiery. Experience alone solved the problem but that's so long ago and the color has become so obsolete that we haven't dyed it for at least three years and no longer remember the solution offhand.

Things sailed along pretty well with an occasional new color in demand, such as a better black on cotton or wool, which we soon met by changing dyes or makers. We were getting a foundation in simple dyeing those days and well it was for us. I tremble to think of what might have happened to us had we stepped in now with over eight hundred formulas on record for all kinds of material and all kinds of forms, in all sizes of batches from ten pounds to six hundred pounds. And yet hardly a day goes by but what we learn something new or meet some problem we have never had to solve before. The funny part of it is that we are still often asked over and over again to do something utterly impossible so far as we know or can learn of; for instance, getting a stocking with a combed cotton and wool boot to match a mercerized cotton top. Maybe some one knows the answer. If they do we hope they loosen up.

The dyer has proven his worth by growing with the needs of a more diversified mill. There may be many larger dyehouses but I will venture that not many dye hosiery of all kinds, many kinds of wool or union cloth, raw stock from pure, fine wool, down to waste that comes back from the cards; all kinds of yarn except rayon and silk, and it looks like the former would soon be on the list.

The laboratory expanded in its third year to three times its former size with at least a thousand dollars expended in new equipment. Last year it doubled again with more equipment for dyeing small lots of hosiery.

A Drying Oven Catches Water

I will conclude this by telling an instance how the laboratory proves its worth once of many times. I had asked for an electric drying oven but my request met with neither rebuff nor enthusiasm. There were many reasons for its purchase and, though the price was only about thirty-five dollars, argument failed to change the super's attitude. One day I sent an order through for the oven in the routine manner just to see what would happen. A few days later the oven came, but no one seemed to know who had passed the order and some questions were asked as to its use. I put it to work at once checking up the moisture contents of a carload of soap. After much careful work I found about one hundred and twelve dollars worth of soap had been substituted with water. I don't think it was intentional, just carelessness on the part of the manufacturer. We never had any more water from that manufacturer and we were given a much lower price on our future orders until the deficit was made up.

If The Reporter wants to hear more about the progress of "Hang Do" we will try to help Mr. White out now and again.

SUCCESSOR TO WILLIAM D. LIVERMORE APPOINTED

The American Woolen Company has announced the appointment of Philip F. Ripley to be chief chemist, succeeding the late William D. Livermore. Mr. Ripley has been connected with the American Woolen Company for twenty-five years, the last twenty years as chemist at the Wood Worsted Mills, Lawrence, Mass., and his appointment is in line with the policy of the American Woolen Company to promote, whenever possible, from within its own ranks. His headquarters will be at Andover, Mass., and he will be assisted by Alexander Morrison, who, for some years, was assistant to Mr. Livermore.

I. G. CHEMISTS IN REORGANIZATION OF RUSSIA'S INDUSTRY

Germany will have a controlling finger in the plan of reorganizing the Russian chemical industry. Almost as though it were a move toward an industrial union of Soviet Russia and Germany, an arrangement has been made by the I. G. Farbenindustrie, Germany's big chemical trust, which provides for its supervision of the development now going on within the Soviet industry. This agreement, in addition to making way for the placing of stocks of German dyes in Moscow, Leningrad and other points, specifies the plan of training in German laboratories and factories, Russian chemists, who will later be distributed among the various Soviet chemical plants. Germany will have complete supervision, also, in the building of a larger Russian chemical industry, it is further reported, since the I. G. will appoint executives for the Soviet plants, works managers, chemists, and business experts.

MEASUREMENTS IN CHEMICAL INDUSTRY PLANTS

According to an investigation conducted by a prominent New York concern, 68 per cent of the chemical industries in the United States make careful measurements of the fuel used in their power plants; 64 per cent measure the feed water; all meter the current used, and only 40 per cent meter their steam.

It generally pays to meter everything—fuel, water, electricity and steam, so as to know, always, just how much fuel is being used and what output is being obtained from that fuel. There is no better way in which to keep a constant check on over-all power plant efficiency and economy as well as on departmental efficiency and economy.

RAYON *

PART II

How to Launder Rayon—Mixtures of Cotton and Rayon—Various Garments—Washing of Curtains

By GEORGE H. JOHNSON

ALL-RAYON and rayon-silk pieces that are sent to the laundry should be laundered by hand or else netted and washed in small wash-wheels. Since rayon is a smooth fiber, it is not easily soiled. By the same token, it is not easily cleaned. Neutral soap with water at 90 to 100 deg. Fahr. should be used. Alkaline builder need not be added to the soap, because it is not necessary unless the water is hard. The arguments in favor of using soft water for laundering are too well known to be repeated at this time. Quality work is impossible unless soft water is used. If rayon pieces are laundered by hand they should never be twisted or wrung. Bleaching agents should not be used for white rayon materials, because, like alkaline builders, they are not needed. Rinsing should be conducted at 100 deg. Fahr. The whole secret of washing all-rayon garments is care.

Rayon or part-rayon stockings should be turned inside out previous to laundering. Use a formula based upon the following:

First Bath—Lukewarm water (100 deg. Fahr.) 3 inches in the inside cylinder. Add a neutral soap solution sufficient to form a good suds. Run twenty minutes.

Second Bath—Lukewarm water (100 deg. Fahr.) to half cover the goods. Do not float them. Run five minutes.

Third Bath—Repeat.

Fourth Bath—Repeat.

Mixtures of white cotton and rayon, such as are commonly encountered in the power laundry, present a more difficult laundering problem. The rayon usually is present either as filling or as decorative stripes. Although rayon is a smooth fiber that is not readily soiled and that also is cleaned with comparative ease, cotton, partly because of its structure, holds dirt tenaciously. As a result, methods that are suitable for laundering rayon or silk are not suited for cotton. Soap alone at the temperature of 100 deg. Fahr. is not effective enough to properly cleanse white cotton goods. It has been shown that white cotton is best cleansed by a proper proportion of tallow soap and alkaline builder dissolved in soft water at temperatures ranging between 160 and 180 deg. Fahr. Unfortunately, rayon sometimes is subject to attack in solutions of alkaline builder at the higher limits of temperature. And so the launderer finds that to properly conserve the rayon in such merchandise he must keep his builder down to a minimum and keep the temperatures of his suds below 150 deg. Fahr.; 140 deg. Fahr. is a safe temperature to use. It is interesting to note that this temperature also has been recommended by several manufacturers of rayon and, more recently, by the technical department of the National Association of Cotton Manufacturers.

A washing formula may be used based on the following. Pieces should be netted whenever it is possible:

First Bath—Warm water (95 to 100 deg. Fahr.); 5 inches of water in cylinder after the goods are saturated. Add a mixture of three parts neutral 88 or 92 per cent soap and 1 part of soda ash or its equivalent to make a good suds. Run ten minutes.

Second Bath—Hot water (140 deg. Fahr.) at 5 inches. Add soap and builder as before. Run ten minutes.

Third Bath—Repeat and add 2 quarts of 1 per cent bleach or its equivalent for every 100 pounds of goods after the soap and builder have been added. Keep the temperature down to 140 deg. Fahr. and run ten minutes.

Fourth Bath—Hot rinse (140 deg. Fahr.); 10 inches of water. Run five minutes.

Fifth Bath—Repeat.

Sixth Bath—Repeat.

Seventh Bath—Repeat.

Eighth Bath—Hot water at 140 deg. Fahr.; 6 inches of water. Sour and blue. Run eight to ten minutes.

Ninth Bath—Cold rinse for five minutes.

[Note: If oxalic acid is used as a sour, modify the formula by adding an additional high rinse. Remember that rayon, like cotton and linen, is subject to attack by oxalic acid if rinsing is neglected. If the cotton is not properly cleansed, an additional ten-minute suds may be used, but keep the temperature down to 140 deg. Fahr.]

The above formula is based upon the use of soft water. French cuffs containing rayon stripes or filling should never be scrubbed or rubbed in any way. Dip French cuffs in hot soap solution previous to throwing the shirts in the wash-wheel if they are badly soiled. When pulling the load, particularly if the pieces are too large to be netted, considerable care must be taken that the rayon is not torn by rough handling. The same thought applies to loading and unloading extractors. Instruct every laundry employee who handles rayon materials while they are wet to use care. Table 4 tells why.

Cotton shirts containing colored cotton and rayon stripes may be laundered according to the above formula, but the use of bleach should be omitted.

Colored cotton-rayon pieces, if small, should be netted and laundered somewhat as follows:

*Extracted from a special bulletin issued by the Laundry-owners' National Association, La Salle, Ind. The author is research fellow at the Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pa

First Bath—Warm water (95 to 100 deg. Fahr.); 5 inches. Add a mixture of 3 parts of 88 or 92 per cent neutral soap and 1 part of soda ash or its equivalent to make a good suds. Run ten minutes.

Second Bath—Warm water (100 to 110 deg. Fahr.). Add soap and builder as before and run ten minutes.

Third Bath—Repeat.

Fourth Bath—Warm rinse at 110 deg. Fahr.; 10 inches of water. Run five minutes.

Fifth Bath—Repeat.

Sixth Bath—Repeat.

Seventh Bath——Repeat.

Eighth Bath—Cold rinse; 10 inches of water. Sour and run five minutes.

[Note: If the pieces are badly soiled, an additional suds may be found necessary. If oxalic acid is used, add a precautionary high rinse or two.]

Cotton warp-rayon filling curtains are frequently encountered, and, as is customary, must always be washed in nets. The following formulas may be used:

White Curtains

First Bath—100 deg. Fahr.; 5 inches of water. Add a mixture of 3 parts of 88 or 92 per cent neutral soap and 1 part of soda ash or its equivalent. Run five minutes.

Second Bath—120 deg. Fahr.; 5 inches of water. Add soap and alkaline builder as before and run ten minutes.

Third Bath—Repeat, adding a small amount of bleach if necessary, keeping the temperature down to 120 deg. Fahr. Run ten minutes.

Fourth Bath—120 deg. Fahr.; 10 inches of water. Rinse five minutes.

Fifth Bath—Repeat.

Sixth Bath—Repeat.

Seventh Bath—120 deg. Fahr.; 10 inches of water. Sour and blue if necessary.

Eighth Bath—Cold rinse.

[Note: The third bath will not be necessary unless the curtains are badly soiled.]

Especial care must be used when handling rayon filling curtains on the drying frames. The rayon filling is seldom supported by the use of mercerized cotton or true silk along with the rayon, and therefore must be handled carefully.

Ecru and Colored Curtains

First Bath—100 deg. Fahr.; 5 inches of water. Add neutral soap and run five minutes.

Second Bath—100 deg. Fahr.; 5 inches of water. Add soap and run ten minutes.

Third Bath—Repeat if the curtains are badly soiled.

Fourth Bath—100 deg. Fahr. Rinse with 10 inches of water for five minutes.

Fifth Bath—Repeat.

Sixth Bath—Repeat.

Seventh Bath—Cold rinse with 10 inches of water. Run five minutes.

When rayon is used in conjunction with wool, the material should be laundered according to the regular procedure for woolens.

CORRECTION

In the first part of the above article, published in the November 29 issue, a statement appeared under the heading, "Chemical Properties of Rayon," as follows: "Rayon is not affected seriously by Javel water if the latter supply is used in the proportions of 2 quarters of 1 per cent bleach to every 100 pounds of material." This should have read "2 *quarts* of 1 per cent bleach to every 100 pounds of material." This proportion figures down to an available chlorine content of about .006 per cent when diluted by 90 gallons of water present in a 36 by 54 inch washwheel.

DU PONT ISSUES NEW GOLDEN YELLOW

A new acid color that produces brilliant golden yellow shades on silk and wool has just been placed on the market by E. I. du Pont de Nemours & Co., under the name of Du Pont Azo Yellow Concentrated.

According to the announcement, an important feature of this color is that on cotton-silk unions from a neutral bath the silk is left unstained. It is said to be very level dyeing and very fast to acids and to show good resistance to ammonia, perspiration, carbonizing and ironing. It is also satisfactory for spun silk.

On half-wool unions the vegetable fiber is unstained when dyed from an acid bath. It is suitable for printing on both wool and silk, although not frequently used in this manner.

SOLVAY PROCESS ABSORBS WING & EVANS

After January 1 the products of the Solvay Process Company will be distributed exclusively by a newly formed company, the Solvay Sales Corporation. The Solvay Sales Corporation, effective on the same date, will acquire the entire business of Wing & Evans, Inc., and will assume as principal all contracts executed by Wing & Evans, Inc., covering products of the Solvay Process Company.

The Solvay Sales Corporation will take over the entire personnel of Wing & Evans. All offices and branch offices of Wing & Evans, Inc., will be continued as offices of the new company.

The German I. G. has acquired or leased from the British firm known as Scottish Dyes, Ltd., the use of its patents and processes for the manufacture of Jade Green. It will be recalled that the Scottish Dyes, Ltd., has recently been taken over by the British Dyestuffs Corporation and, therefore, the acquisition or lease of the patents for Jade Green is interesting as an indication of co-operation between British and German dyestuffs industries.

Technical Notes from Foreign Sources

Sulphur Dyestuffs on Mercerized Yarns

Sulphur colors have been largely used for dyeing yarns for knitting and sewing purposes. It is important that the yarns are thoroughly boiled out before being dyed, so that the color can easily and uniformly penetrate through the fiber. Cotton yarns must be boiled out with soda solutions in order to remove the fats, waxes and dirt. Washing with pure water can be omitted, as the sulphur dye liquor is alkaline. The yarns need not be bleached, for the sulphur colors are mostly used for producing dark shades on the yarns.

The sulphur dyestuffs are used in open kettles and the dyeing is generally carried out in machines. Due to the presence of sodium sulphide in the liquor, only wooden or iron vats can be employed without copper rollers and the like. The color liquor is as short as possible, about 1,000 liters per 100 pounds of the cotton yarn. In dyeing light shades, inclusive of the grays, about one and one-half times the weight of the dyestuffs of sodium sulphide is employed. Sulphur green is an exception to this general rule, as in this case the weight of sodium sulphide is equal to the weight of the dyestuff. The color bath also contains 2½ per cent of soda and 2 per cent of Turkey Red oil, figured on the weight of the cotton yarn.

The dyeing is commenced at a temperature of approximately 45 deg. Cent. and the yarn is drawn through the liquor two to three times. Then the temperature is raised to 75 deg. Cent. and the dyeing is continued at this temperature for three-quarters to one hour. When the desired depth of color is attained, the yarn is removed, the excess color liquor is allowed to drain off and it is washed. In the case of dark shades, the quantity of sodium sulphide is increased to three-quarters to equal weight of the dye. After the dyestuff has been dissolved, 5 per cent soda and 2 per cent of Turkey Red oil are added. The dyeing is again commenced at a temperature of 45 deg. Cent., the liquor then being heated to approximately 80 deg. Cent. with the addition of 15 to 30 per cent of common salt. The dyeing lasts from three-quarters to one hour at 80 deg. Cent. The yarn is then removed, washed and dried.

The color of the yarn will be improved by allowing it to hang for some time in the air. Mercerized cotton will, of course, dye more readily than cotton yarns. The addition of Turkey Red oil has proven particularly advantageous in the dyeing of strongly twisted yarns, which will not dye uniformly unless this substance is present. However, the dyeing of such yarns requires considerable care, and a particularly important condition is the temperature, which must not be too high. (Deutsche Faerber Zeitung, 1926, 475.)

Mordanting and Dyeing Wool

In the chrome mordanting of wool the bichromate is reduced so as to be entirely absorbed by the wool fiber, the reduction taking place by the aid of a thiosulphate. Thus wool is treated with sodium bichromate solution. Then sulphuric acid is added and finally a solution of sodium thiosulphate. To the latter solution may be added borax or sodium acetate. Any acid groups which remain in the mordant may be removed by treatment of the wool with mild alkalies, such as sodium carbonate or ammonia.

In most cases dyeing, as for example with hematine, may be conducted in the alkali bath, which is known as sequence dyeing, but in other cases the addition of a weak acid is necessary to start the dyeing. Alternatively, the dye and the alkali may be mixed together, the bath being subsequently acidified with acetic, lactic or formic acid. Sequence dyeing may be employed with the compound blacks consisting of hematine with Durochrome Black A, Eriechrome Blacks A and T, and Diamond Black PV. With Diamond Black PV and other after-chrome colors, the procedure is as follows: The wool is first dyed, and after exhaustion of the bath there is added in order sodium dichromate, sulphuric acid, and sodium thiosulphate. Hematine crystals containing sodium carbonate are then added and finally acetic acid. (British Patent No. 253,662.)

Treating Fabrics with Liquids

A lustrous fabric, as a substitute for glacé thread fabric, is woven from raw yarn and dyed in the piece, or is made from dyed yarn, and is then impregnated with a finishing substance. Then it is treated on one or both sides while moist and stretched by quickly-

moving brushes. This process is patented in British Patent No. 25,244 and the machine in which it is carried out is shown in the accompanying illustration.

The fabric from a roll *d* passes over tensioning rollers *e* to a trough *f* containing the finishing liquid, and then to rapidly-revolving brushes *a*, weighted rollers *c* being arranged between each two brushes. Heated drugs or pairs of drums may be arranged between consecutive brushes. The finished fabric is wound on a beam *g*, after being dried in the usual manner, and

after leaving the last brush *a*. The finishing material may be mixed with the dyestuff.

Protecting Wool Against Bacteria

Wool is protected from damage by bacteria by treatment with a solution of an alkylated naphthalene sulphonic acid. This treatment is applied separately before or after treatment with alkali or alkaline baths in the usual course of manufacture, as salts of alkylated naphthalene sulphonic acid have little or no tendency to improve the resistance of the woolen fiber to bacteria. The treatment may be applied to the loose wool, or to yarn or piece goods at any stage.

For example, 50 kilograms of wool are treated, after the usual washing, for one hour at a temperature of 50 deg. Cent. in a bath which contains 12½ kilograms of dibutyl-naphthalene sulphonic acid in 1,200 liters of water, after which the wool is rinsed. (British Patent No. 256,273.)

Preventing Rapid Decomposition of Ice Colors During Printing

In printing ice colors during the summer months, the usual wooden furnishing rollers of the printing machine are replaced by hollow iron or copper rollers each closed at one end and having a coverable opening at the other by which the roller is filled with ice or other freezing mixture. The rollers of padding or dyeing machines containing diazo solutions may be cooled similarly. (Bulletin Societe Industrielle Mulhouse, 1926, volume 92, pages 163-4.)

Technical Analysis of Indanthrene Vat Dyes

Simple titration of the vat with mild oxidizing agents, for example Methylene Blue or ferric ammonium sulphate, does not give the true excess of hyposulphite present, but the total reducing power of the hydrosulphite and the dye together. By adding formaldehyde to the vat the hydrosulphite is stabilized, while the dye acids are precipitated, so that after addition of acetic acid, filtration and addition of sodium acetate and salicylic acid to the filtrate, the hydrosulphite may be determined by titration with ferric ammonium sulphate. The content of the dye in the vat may be determined gravimetrically by oxidizing the vat with a mixture of ferric ammonium sulphate, sodium acetate, and acetic acid, filtering through a Jena sintered glass crucible, and washing the precipitate thoroughly with acid, alkali and water. The free sodium hydroxide in the vat is best determined by adding barium chloride, in order to precipitate sulphites and carbonates, and neutral formaldehyde, in order to bind the hydrosulphite, and then immediately and without filtering titrating with tenth normal acetic acid, using phenolphthalein as the indicator. (Zeitschrift fuer angewandte Chemie, 1926, volume 39, pages 900 to 903.)

Potassium Salts in Printing Textiles

The common practice of replacing potassium salts by the cheaper corresponding sodium salts in printing processes sometimes gives less satisfactory results. White resists for alizarine shades are much clearer when obtained by means of potassium citrate than with sodium citrate, particularly when the resists are overprinted with Aniline Black. A satisfactory resist for the latter process is prepared by adding approximately 26.3 kilograms of potassium hydroxide, which is free from sodium hydroxide, to 28 kilograms of citric acid in the crystalline form and 23 liters of water until the mixture is slightly alkaline and then adding 18 kilograms of gum arabic or gum senegal.

In dyeing with ice colors, for example Para Red, the progressive discoloration (brown) which occurs with fabric prepared with a solution of beta-naphthol in sodium hydroxide may be avoided by the use of potassium hydroxide. The dry prepared fabric may then be stored for several weeks without decomposition or discoloration, and the resulting shade in the case of Para Red is bluer than that similarly obtained with sodium hydroxide. A preparation made with potassium hydroxide is especially suitable for the production of Para Red discharges on Aniline Black. (Melliand's Textilberichte, 1926, volume 7, 615-16.)

Shading Ice Colors on Cotton

The ice colors produced on cottons, built up with the aid of azo dyestuffs components, which have a certain affinity, are overdyed with basic colors. The shades obtained in this manner are resistant to soaping. The azo dyestuffs components are such substances as the acylaminonaphthols, the urea derivatives of 2-amino-5-naphthol-7-sulphonic acid, pyrazolone derivatives, acetic acid arylides, 2:3-oxynaphthoic avid arylides and others of similar nature. (German Patent No. 427,962.)

Dyeing Animal Fibers in Several Shades

The animal fiber, particularly wool, is treated with substances which are solid in the cold and liquid at elevated temperatures. Such substances as paraffine, stearine, wax, spermaceti are indicated. The fiber is irregularly colored through the melting of these substances. The new process consists in the use of other materials in their place, substances which can be fixed on the textile fiber as such or which are produced on the fiber through chemical reaction. Solids such as gypsum, chalk, and heavy spar are indicated. (German Patent No. 427,953.)

Impregnating Masses

A mixture of unsaturated oils with sulphur and a bitumen is used. The latter substance is obtained by the distillation of asphaltic crude petroleum. Thus,

for example, castor oil is heated with sulphur to a temperature of 200 deg. Cent., and then the bitumen is added. The mixture is then particularly well-suited for the impregnation of sack cloths. (German Patent No. 426,733.)

Chemical Mechanism in Dyeing with Vat Colors

Dyeing cotton with vat dyestuffs has been studied and several interesting observations have been made on the behavior of the leuco derivatives of the vat colors on the fiber in an atmosphere of carbon dioxide.

Under these conditions it is found that Flavantherene, Indigo, Thioindigo, Tetrabromoindigo have very different affinities for the cotton fiber. This is an important observation, for good results can be obtained only when the leuco derivatives of the dyestuffs have satisfactory affinity towards the fiber.

It was established in a preliminary test that the cotton fiber, which is dyed with the blue leuco derivative of Indanthrene Blue RS in an atmosphere of carbon dioxide, has a very noteworthy fastness to soaping at a temperature of 90 deg. Cent. It was also determined that due to the presence of carbon dioxide the greater portion of the free dyestuffs and not its salt is fixed on the fiber.

Another test, carried out with greater care, showed that a sample of cotton dyed in an atmosphere of carbon dioxide with the leuco derivative of a vat color, and then wrung out and soaped hot, was not only thoroughly fast but also gave much deeper shades, after the color had been developed in air, than are commonly obtained.

Almost the same results were obtained with Indanthrene Orange, Indanthrene Gold Orange and Indanthrene Yellow. The results are particularly interesting in that the free acid of the color has a different shade in the reduced condition than its alkali salt.

For example, Indanthrene Orange was brown in the free acid state and violet in the form of an alkali salt. Indanthrene Golden Orange was reddish yellow in the free acid state and Magenta Red in the alkali salt form. This difference in the color makes it possible to determine even in the soaping stage whether the free acid of the dyestuff is present on the fiber or not. It is more difficult to do this in the case of Indanthrene Blue and Yellow, for in these cases the color of the free acid is almost the same as that of the alkali salt. (Textile Mercury through Der Textilchemiker und Colorist, 1926, pages 136 to 137.)

Robert Clay, Ltd., of Cheadle in British Patent 251,102 describes a process of obtaining linen effects on cotton. The fabrics are first printed with sulphuric acid about 110 deg. Tw. to impart a parchmenting wool. The resisted portion of the fabric remains soft, while to the unresisted part a linen like appearance and handle is imparted.

RECENT PATENTS

Bleaching Process

(1,597,880; August 31, 1926)

William D. Gregor, Wesley M. Osborne and Alex J. Kemzura, Newton Falls, N. Y.

The process of bleaching paper pulp which comprises intimately commingling the pulp in a wet and unbleached state with a bleaching agent in an amount sufficient only to partially bleach same at a temperature of about 70 deg. Fahr., permitting the reaction to proceed until the activity of the bleaching agent is substantially exhausted, washing the partially bleached pulp, and intimately contacting the partially bleached pulp with a bleaching agent in an amount sufficient to bleach the pulp to the desired degree at a temperature of approximately 85 deg. Fahr.

Greasing Textile Fibers

(1,598,402; August 31, 1926)

Paul Moritz Spiess, Bremen, Germany, assignor to Amid Duron Company, New York, N. Y., a Corporation of New York.

The process of treating textile fibers, which comprises greasing the same with a synthetic ester of a monovalent alcohol and a fatty acid.

Method of Treating Textile Material

(1,598,305; August 31, 1926)

Robert A. Phair, Allendale, N. J., assignor, by mesne assignments, to H. Kohnstamm & Co., Inc.

The method of removing the fats and waxes in textile materials which consists in boiling them in aikaline solution containing magnesium oleate.

Azo Dyestuffs and Intermediates, and Process for Making Same

(1,597,791; August 31, 1926)

Eric Berkeley Higgins, London, England.

The process for making dye intermediates which consists in treating an arylamide of an ortho-carboxy-substituted naphthol or phenol by a substance which causes the labile hydrogen of the groupp OH.CO—NHR to be replaced by the residue of a quarternary ammonium base.

Sulphur Black and Similar Sulphur Dyes

(1,598,303; August 31, 1926)

Morris Paley, Charleston, W. Va.

Sulphur dyes comprising a sulphur product obtained from the thionation of an intermediate usually employed in producing such dyes with flowers of sulphur and crude sulphur.

In order to increase space for a dyeing and finishing department and for the purpose of having room for new equipment, a one-story fireproof addition 80 by 100 feet, is to be erected at the Waucantuck Mills, Inc., plant at Uxbridge, Mass. These mills are equipped with fifty-six broad and forty-two narrow looms in the manufacture of fancy worsteds for men's wear and fine worsted yarns. William J. Brady is listed as the treasurer and buyer.

George W. Turnipseed will retire as superintendent of the Buck Creek Mills, Siluria, Ala., on January 1, 1927.

Carl R. DeLong has been placed in charge of the commercial research department of the Federal Phosphorous Company, at Birmingham, Ala. Mr. DeLong has been chief of the Chemical Division of the Tariff Commission at Washington, D. C. His position there will be temporarily filled by W. N. Watson, who has been the color specialist of the division.

The Kenneth Mills, Walhalla, S. C., will probably erect a dye plant. The company recently booked an order for 35,000 rayon bedspreads for the J. C. Penney Company.

Frank L. D. Weymouth, Bangor, Me., has assumed his duties as instructor in the chemistry and dye department at the New Bedford (Mass.) Textile School. He succeeds John H. Skinkle, of New Bedford, who resigned to take a position as chemist with the New Bedford Gas & Edison Light Company. Mr. Weymouth is a graduate of Clark University, where he specialized in chemistry and has completed several courses of study at Boston University. He was formerly with the Worcester Gas Company.

Michael F. Sullivan has taken the position as overseer of finishing for the Norad Mills, North Adams, Mass. Mr. Sullivan was formerly employed at the Merrimack Woolen Company, Dracut, Mass.

Robert Daughtery has resigned as secretary of the Icemorlee Mills, Monroe, N. C.

It is understood that the Universal Looms, Inc., of Easton, Pa., will establish a silk mill at Winchester, Va., to be known as the Winchester Silk Company. The proposed mill building will be one story, brick construction.

F. M. Fessenden, resident manager of the Sayles-Biltmore Bleacheries, Biltmore, N. C., has announced that the plant at Biltmore will begin operations about January 1. The first unit of the plant is practically completed, and machinery is being installed rapidly.

Frank E. Kenyon, for more than a quarter of a century superintendent of the Pacific Mills, at Lawrence, Mass., has resigned in order to retire from active work. Mr. Kenyon is well known in the textile trade, having been with other prominent mills before going to Lawrence.

Definite conclusions and practical recommendations for eliminating the health hazards of benzol in American industry are contained in the final report of the committee on benzol poisoning of the Chemical and Rubber Sections of the National Safety Council.

It is reported that an addition to be used as a dyehouse is to be added to the Morrison Mill Plant No. 2, which recently was placed in operation by Edward Chase, who bought the plant, located at Dexter, Maine, a few months ago.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

UNUSUAL OPPORTUNITY

We have an attractive proposition for a result producer to promote the sale of our complete line of chemical textile specialties, such as Sulphonated Oils, Finishes, Softeners, etc., in Rhode Island and Connecticut. Only those fully qualified and who know how to produce need apply. All replies strictly confidential. Our organization knows of this advertisement. Reply, Box 361, American Dyestuff Reporter.

FRESH FLORIDA ORANGES

Fresh Sweet Florida Oranges, $3.00 per box of three hundred large size. Sound fruit and satisfaction guaranteed or money back. We pay express charges. A box of these makes an appreciated Christmas gift. Remit with order. Acme Farms, Gainesville, Florida.

USED MACHINERY FOR SALE

Rates $5.00 per column inch or less per insertion.

1—24″ Troy Copper Basket Extractor.
3—26″ Tolhurst Copper Basket Extractors.
1—28″ Troy Copper Basket Extractor.
1—30″ Troy Copper Basket Extractor.
1—30″ American Copper Basket Extractor.
2—32″ Tolhurst Copper and Steel Basket Extractors.
2—32″ S & U Copper Basket Extractors.
2—32″ S & U Steel Basket Extractors.
1—36″ S & U Copper Basket Extractor.
3—40″ Tolhurst Copper Basket Extractors.
2—42″ Broadbent Copper and Steel Basket Extractors.
1—42″ American Tool and Machine Copper Basket Extractor.
3—48″ S & U Copper and Steel Basket Extractors.

Box 364, American Dyestuff Reporter, 90 William St., New York.

1—48′ Granger 90 ft. Tenter Frame—Clips.
1—104″ Tenter Frame, 27 ft. long—Pins.
1—66″ Kenyon Tenter Frame, 54 ft. long.
1—80″ Kenyon Return Tenter Frame, 5 Sections.
1—60″ Thewlis Double Tiger and Raising Machine.
1—Davis & Furber 2 Cylinder Warp Dresser.
2—36″ Curtis & Marble Rolling-Up or Boarding Machines.
1—40 Spindle Morrison Skein Silk Washing Machine.
1—44″ Cloth Winding Machine.
1—72″ Winding and Measuring Machine.
1—64″ Mansfield Batch Winder.

Box 367, American Dyestuff Reporter, 90 William St., New York.

1—38″ Curtis & Marble Yard Folder.
1—39″ Elliott & Hall Yard Folder.
1—42″ Monforts Double Folder.
2—54″ Curtis & Marble Adjustable Cloth Folders.
2—32″ Curtis & Marble Cloth Inspection Machines; NEW.
2—42″ Curtis & Marble Cloth Inspection Machines.
5—48″ Curtis & Marble Cloth Inspection Machines.
2—50″ Van Vlaanderen 3 Roll Mangles.
1—66″ Curtis & Marble Eiderdown Napper.
1—80″ Gessner 24 Roll Single Acting Napper.
2—48″ Hermas Picking Machines.
1—66″ Gessner Double Bed Rotary Cloth Press.
1—46″ King & Gerber 3 Roll Quetch.

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1—Vacuum Machine Co. Raw Stock Dyeing Machine.
3—Klauder-Weldon Raw Stock Dyeing Machines.
1—500 lb. Franklin Process Dyeing Machine.
1—25 Stick Klauder-Weldon Yarn Dyeing Machine.
1—28 Stick Klauder-Weldon Yarn Dyeing Machine.
1—600 lb. Klauder-Weldon Yarn Dyeing Machine.
2—300 lb. Hussong Yarn Dyeing Machines.
1—500 lb. Hussong Yarn Dyeing Machine.
1—3 Compartment Hebden Dyeing Machine.

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1—32″ Parks & Woolson Single Shear.
2—60″ Parks & Woolson Single Shears.
2—72″ Curtis & Marble Single Shears.
1—76″ Parks & Woolson Single Shear.
1—78″ Parks & Woolson Single Shear.
1—80″ Parks & Woolson Single Shear.
1—16′ Curtis & Marble Cross Cut Shear.
1—96″ Thewlis Bias Single Shear; NEW.
1—2 Cylinder Saco Lowell Slasher—54″ width. Complete Equipment.
1—Saco Lowell Hot Air Slasher.

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1—Set Textile Finishing 11 Copper Can Cylinder Dryer; 23″ dia. by 41½″ face.
1—Set Granger 20 Copper Can Cylinder Dryer; 23″ dia. by 56″ face.
3—Sets 10 Can Textile Finishing Machinery Cylinder Dryers; 23″ dia. by 60″ face.
1—Set Textile 28 Can Cylinder Dryer; 23″ dia. by 70″ face.
1—Set Textile Finishing Machinery 11 Can Cylinder Dryer; 23″ dia. by 72″ face, tinned steel.
1—Set Textile 12 Can Cylinder Dryer; 18¼″ dia. by 72″ face.
1—Set 26 Can Butterworth Cylinder Dryer; 23″ dia. by 90″ face.
1—Set 18 Can Butterworth Cylinder Dryer; 23″ dia. by 108″ face.
1—Set 18 Can Butterworth Cylinder Dryer, 23″ dia. by 142″ face.
1—Set 26 Can Butterworth Cylinder Dryer; 23″ dia. by 144″ face.
1—Set 30 Can Butterworth Cylinder Dryer; 23″ dia. by 144″ face.
1—Set 56 Can Butterworth Cylinder Dryer; 23″ dia. by 144″ face.
1—Sargent 3 Apron A-1 Raw Stock Dryer.
1—Proctor & Schwartz Automatic Yarn Dryer.
1—48″ Proctor & Schwartz Looping Dryer.
1—54″ Proctor & Schwartz Looping Dryer.
1—80″ Kenyon Return Tenter Dryer
1—96″ Proctor & Schwartz Looping Dryer.
3—Proctor & Schwartz 2 Truck Yarn Dryers.

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1—66″ Curtis & Marble Card Wire Double Brush and Steamer.
1—66″ Thewlis Double Brusher and Steamer; BRAND NEW.
1—42″ Van Vlaanderen Button Breaker.
1—48″ Van Vlaanderen Button Breaker.
1—32″ Granger 5 Bowl Calender, 3 Husk, 2 Steel Heated.
1—42″ Butterworth 3 Roll Heavy Calender.
2—48″ King & Gerber 3 Roll Calenders.
1—60″ Calender—2 Rolls.
1—66″ Textile Finishing Machinery 3 Roll Calender.
1—72″ Kenyon 2 Bowl Crabbing Machine.
1—Parks & Woolson Decating Outfit.
1—48″ Schofield Cloth Doubling and Winding Machine.
1—66″ Windle Cloth Doubling and Winding Machine.
1—66″ Schofield Cloth Doubling and Winding Machine.
4—65½″ Parks & Woolson Double Shears with list save.
3—Luther 2 Brush Dressers.
3—Morrison Single Brush Dressers.

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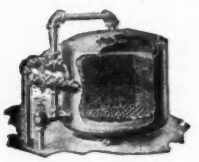

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